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ABSTRACT

This report examines issues of teacher supply and demand in Ohio, analyzing: demand for educators; supply of teachers in terms of outflows (teachers leaving the system through retirement or attrition and teachers moving across school districts); and supply of teachers in terms of inflows (beginning teachers and former teachers re-entering the labor market). Overall, Ohio faces teacher shortages in specific subject areas, particularly math and science, though special education has the most severe shortages. Teacher mobility differs by district type, with large urban and poor rural school districts having the most difficulty retaining teachers. Minority teachers and other education professionals are significantly underrepresented in comparison to the percentage of minority students attending Ohio public schools. The rate of teacher retirement is increasing. Ohio's teacher attrition rate resembles that of other states and is comparable with attrition in other fields. Ohio teachers who leave teaching often return. Teacher salaries are low compared to salaries in other fields. Implementation of the new licensure system needs monitoring over the next few years. Recommendations include tracking trends and changes in an annual report and using the Integrated Licensure System to compile data for the annual report. A list of professional occupations and salaries is appended. (SM)

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May 2002

Preliminary Analysis of Ohio's Labor Market for Teachers and Other Education Professionals

Howard Fleeter and William Driscoll

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PRELIMINARY ANALYSIS OF OHIO'S LABOR MARKET FOR TEACHERS AND OTHER EDUCATION PROFESSIONALS

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Preliminary Analysis of Ohio's Labor Market for Teachers and Other Education Professionals

Executive Summary

May, 2002

The Ohio State Board of Education directed the Department to review issues of teacher supply and demand in order to provide answers to key policy-related questions regarding the topic. Dr. Zelman, Superintendent of Public Instruction, responded by committing to develop an on-going system to analyze the data and report to the Board on an annual basis the Condition of the Teaching Profession.

Introduction

In order to create a policy-relevant system and provide the Board with accurate and credible reports on the supply and demand for Teachers in Ohio, the Center for the Teaching Profession, in collaboration with the Office of Policy Research and Analysis, embarked on a study of the currently available information. The firm of Levin and Driscoll, known for their expertise in state economic issues, was contracted to conduct this study. Howard Fleeter, the lead investigator for the study, reported to the Resources Committee on the findings of the study at the January, March, and May 2002 meetings. The detailed technical report discusses school districts' needs for teachers and administrators from an economic perspective. The report is divided into four parts:

- An analysis of the demand for educators
- An analysis of the supply of teachers in terms of "outflows" - teachers leaving the system through retirement or attrition and those who move across school districts
- An analysis of teacher supply "inflows" - beginning teachers and former teachers re-entering the labor market.
- A synthesis of the findings from across these analyses.

Main Findings of the Study

This executive summary shares the synthesized findings and provides supporting analysis for each finding. Supporting analyses are drawn from all parts of the study.

1) Ohio faces teacher shortages in specific subject areas in 2002. Over the past five years, the enrollment of students in Ohio's public schools has remained fairly constant, with minor fluctuations resulting in a very small (0.3%) net decline. Table 1 shows this change.

Table 1

Year	Total ADM (October Count)	% Increase in Total ADM
FY98	1,764,518	--
FY99	1,765,780	0.1%
FY00	1,757,435	-0.5%
FY01	1,760,043	0.1%
FY98-01 Change	-4475	-0.3%

In spite of a constant enrollment, changes in the makeup of Ohio's student body and changes in education requirements have increased the demand for certain kinds of teachers. For example, the percentage of Ohio's students who have been identified as needing special education services has increased over the past five years. Specific subject area shortages are math, science, and special education, as many practitioners and research studies suggest, along with music, foreign language and computers, which tend to be less well recognized.

An analysis of a job-posting database maintained by ODE compared demand for teachers in specific subject areas between 1999 and 2002. Table 2 presents data on the number and percentage of teaching openings by subject area. Math and science, two areas of shortage always prominently mentioned as problematic by researchers and practitioners, account for over 20% of the positions advertised.

Table 2: Number and Percentage of Regular Classroom Teaching Positions by Subject Area

Subject Area	Number of Vacancies	Percentage of Total Vacancies
Mathematics	325	11.7%
Science	284	10.2%
Elementary	281	10.1%
English/Lang. Arts/Reading	277	9.9%
Vocational/Industrial Arts	264	9.5%
Foreign Language & ESL	236	8.5%
Music	194	7.0%
Gifted Education	154	5.5%
Phys Ed./Health	124	4.5%
Art	110	4.0%
Social Science	105	3.8%
Computer Science & IT	96	3.4%

2) Special education has most severe shortages. Special education seems to be the most severe area of teacher shortage in the state, which has experienced an ongoing increase in the number and percentage of special education students. Both a disproportionately large number of job vacancies and a large and increasing proportion of temporary teaching certificates suggest a severe shortage of qualified professionals in this area. In addition, special education teachers have a higher attrition rate than teachers as a whole. It may be that special education teachers stay in teaching but switch out of special education. This would be a contributing factor in the large demand for teachers with these credentials.

Table 3 shows that the number of special education students is increasing, while the total number of students has remained nearly constant:

Table 3: Changes in number of special education students

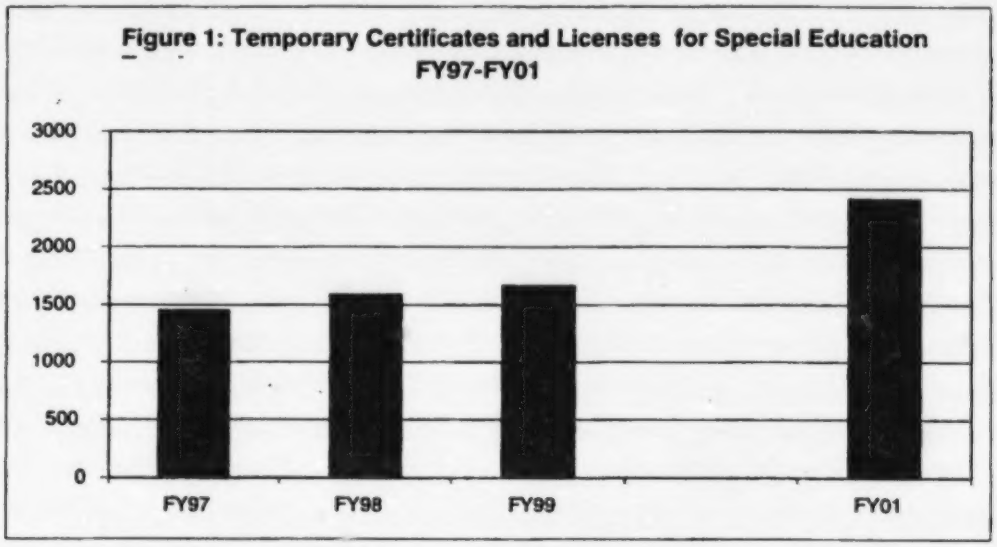
Year	Total Students	Special Education Students	% Increase in Special Education Students
FY98	1,764,518	218,854	--
FY99	1,765,780	221,169	1.1%
FY00	1,757,435	227,195	2.7%
FY01	1,760,043	229,820	1.2%
FY98-01 Change	-4475	10,966	5.0%

Since 1999, the Ohio Department of Education has maintained a website that posts job openings in schools and districts across the state. Posting on this website is optional, and available data suggest that approximately 400 school districts used this method of advertising over 5800 position openings. When the total number of job vacancies posted for certificated personnel were sorted into four broad categories, the percentage of special education vacancies was disproportionate to the total number of special education positions.

Table 4: Number and Percentage of Job Postings by Category

Category	Number of Vacancies	Percentage of Total Vacancies
Classroom teaching	2,784	48%
Special education	1,436	25%
Administration	847	14.5%
Pupil support services	738	12.5%
Total	5,805	

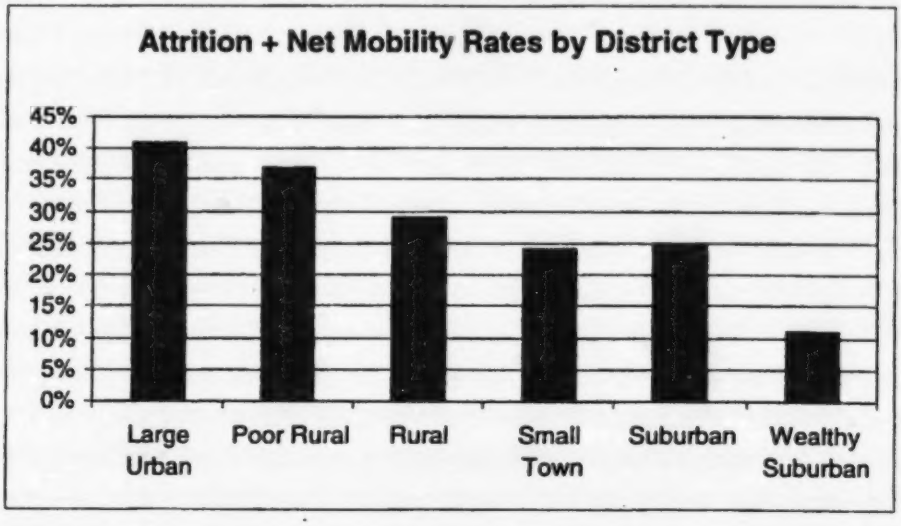
In addition to large numbers of posted vacancies, the number of temporary certificates and licenses for special education teachers is increasing over time.



3) Teacher mobility differs by district type; large urban and poor rural school districts have difficulty retaining teachers. Analysis of mobility of teachers across districts reveals significant differences among different types of schools. When both in- out-migration are considered, large urban and poor rural districts fare the worst and suburban schools fare the best.

The Department of Education has developed a typology for classifying the state's school districts according to demographic characteristics. When the total movement of teachers, as measured by summing attrition and mobility, is compared among types, large urban districts and the poor rural districts are at a disadvantage in the labor market. Further, it becomes clear when the net mobility measure is included that wealthy suburban school districts are participating in the labor market in a manner distinctly different from the other districts in the state. While their attrition rate of 29% is not much different from other types of school districts, their net mobility of -18% indicates that they attract far more experienced teachers than they lose. These findings are depicted graphically in Figure 2.

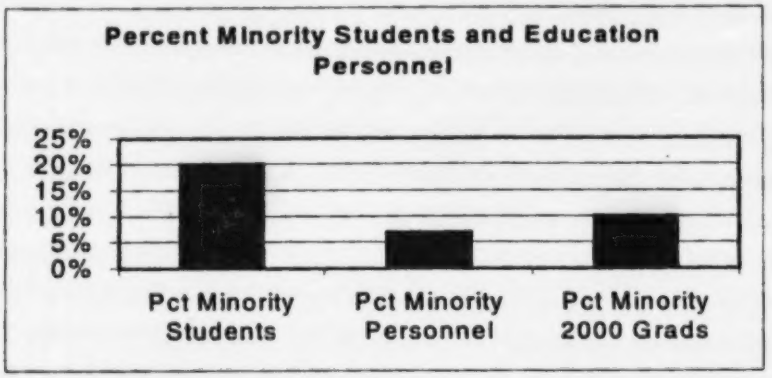
Figure 2



4) More minority teachers are needed. Minority teachers and other education professionals are also significantly under-represented in comparison to the percentage of minority students attending Ohio public schools. This shortage appears to result from a combination of both a disproportionately low percentage of minority students pursuing teaching degrees and a significantly higher propensity of new minority teachers leave teaching. It is not clear if the minority teachers are leaving to pursue opportunities outside of teaching or whether they are leaving as a reaction to characteristics of the workplace.

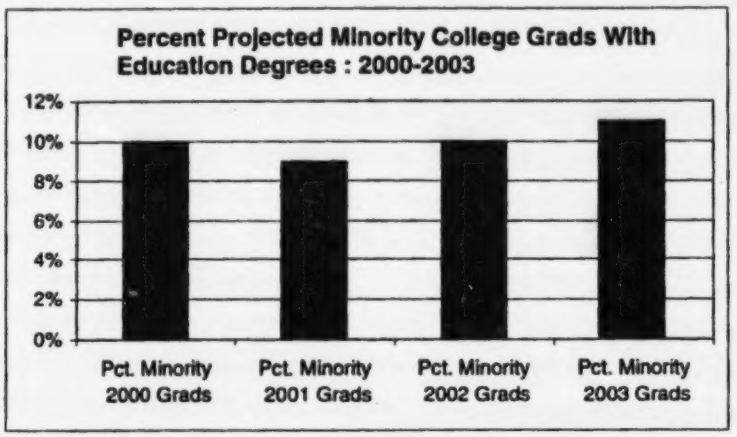
While minority students comprise 20% of Ohio's total enrollment in FY01, minority personnel comprise only 7% of the education staff in the same year.

Figure 3: Percent Minority Students and Personnel, FY01



This under-representation appears to have two sources. First, Figure 4 demonstrates that the percentage of Ohio education graduates who were minority was only 10% in FY00, suggesting that there is also an under-representation of minority students in higher education teacher preparation programs. Figure 4 presents the percentage of minority graduates projected for each year from 2000 to 2003. While there is some variation from year to year (2001 is only 8% and 2003 is 12%), the percentage of minority graduates projected over the four-year period for which data is available is 10%.

Figure 4



The second contributing factor in the under-representation of minority teachers requires a reference to Table 5. This table shows that the attrition percentage for non-white teachers after five years was 45%, a figure significantly higher than the 27% attrition rate of white teachers. Not only does the data suggest that fewer minorities enter teaching, but it seems that they also tend to leave at a greater rate as well. The following table shows the attrition and mobility rates for white teachers compared to non-white teachers.

Table 5: Attrition and Mobility Rates for Beginning Teachers in 1997 through 2002 by Race and Gender

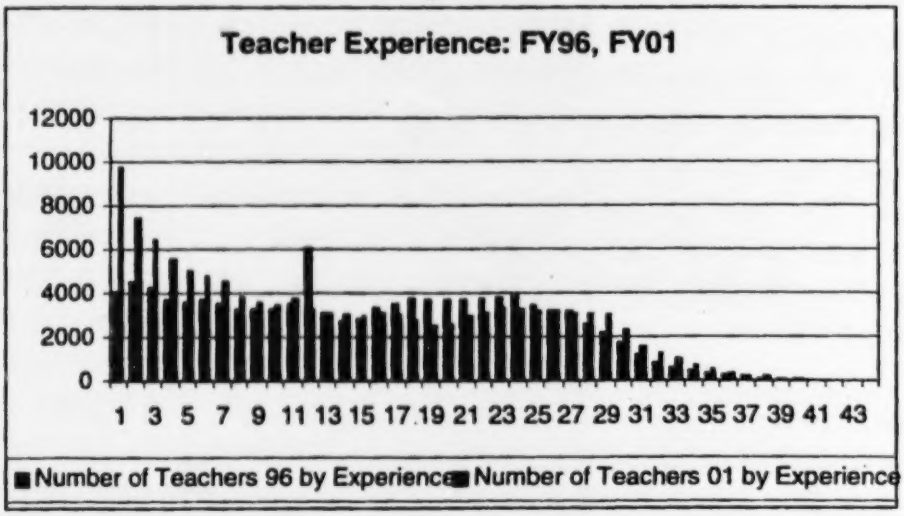
	1997	2000	Teachers leaving the system	Teachers moving from one district to another	Attrition Percent	Mobility Percent
White	3086	2260	826	599	27%	19%
Non-white	290	160	130	21	45%	7%

The white teacher attrition rate is almost the same as the statewide average of 28%. While non-whites are more likely to leave teaching, they are less likely to move from the school district where they begin, at least within the first five years of teaching. The low mobility rate for non-white teachers of 7% shows that their tendency to move between school districts falls well short of the average for the state of 18% or of white teachers whose mobility percentage equals 19%.

5) The rate of teacher retirement is increasing. Analysis of the age and experience of Ohio's current teaching force suggests that Ohio has recently begun a period where retirements will increase at a much more rapid pace than in recent years. This trend will likely get worse before it gets better.

The number of educators expected to retire will influence the future demand for teachers and administrators. In this context, the impact of America's post-World War II "baby boom" is of particular interest. The baby boom initially increased the need for teachers due to the marked increase in the number of students in the 1950s and early 1960s. However, its impact in the year 2002 lies in the pending retirement of the many teachers who were hired from this abnormally large pool. Because retirement benefits steadily increase up to 30 years of experience, many teachers retire at or shortly before this level. Roughly 20,000 current teachers have 30 or nearly 30 years of experience. Figure 5 shows the progression of the "baby boomers' " years of experience by comparing two years' data.

Figure 5


Teacher Experience: FY96, FY01
12000
10000
8000
6000
4000
2000
0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43
Number of Teachers 96 by Experience
Number of Teachers 01 by Experience

Data Source: Ohio Department of Education, April, 2002

6) Ohio's teacher attrition rate resembles that of other states. Analysis of teacher turnover and attrition suggests that Ohio's percentage of teachers who leave teaching within the first five years of employment (28%) is similar to that of other states.

7) Teacher attrition is comparable with attrition in other fields. Comparisons with turnover rates in other fields suggest that attrition rates for teachers are not unusually high. While policies can certainly strive to reduce attrition, particularly for teachers in particular districts and subject areas, a certain level of turnover is both inevitable and desirable. It is desirable, because, as is the case with any profession, some people learn that they do not perform well in the career that they have chosen. Educators do not have a monopoly on concerns about turnover rates in the employment marketplace. For example, a study by the General Accounting Office (GAO) reported that studies of nurses revealed annual turnover rates of 15%, 21%, and 51% for different parts of the labor market for RN and LPN nurses (*Nursing Workforce Emerging Nurse Shortages Due*

to Multiple Factors, GAO, July 2001). Similarly, information technology positions turn over at 15% to 20% per year. Mobility in the job market is a problem confronted by many companies in diverse industries.

8) Teachers who leave a position often return to teaching. Examination of records from the State Teachers' Retirement system found that 18.5% of teachers who leave teaching later return. This percentage is smaller than the 28.5% intended return rate found by analyzing results of surveys of teachers who have left teaching and still live in Ohio. Further study of this issue is necessary to draw conclusions regarding the discrepancy between the stated intent of teachers to return and the actual return rate exhibited between 1991 and 2001.

Responses to a survey sent to former teachers cited "becoming a new parent" as the most frequent single reason for leaving teaching. Approximately 40% of these respondents stated an intent to return to teaching, a significantly higher percentage that from the respondents who left teaching for other reasons.

Survey responses by teachers who have left and are not planning to return to teaching indicate that policy changes may cause them to change their mind. Those who left because they had a child most often cited part-time work opportunities and on-site childcare as a condition that might contribute to their return. Increased salary was the most frequently cited policy among teachers who left for other reasons.

9) Teacher salaries are low when compared to those of other fields, in terms of both current compensation and gain over time. Analysis of teacher salaries over time suggests that teachers have lost ground financially. Comparison of teacher salaries to those of other occupations requiring similar education also suggests that teachers' salaries are relatively low. Finally, comparison of Ohio teacher salaries with teacher salaries in other midwestern states suggests that Ohio is roughly in the middle – higher than some and lower than some.

10) Implementation of the new licensure system (designed to improve the quality of teachers in Ohio) needs to be monitored over the next few years. Ohio is currently in the midst of a transition from the old system of "certification" of teachers and other education professionals to a new system of "licensing" educators. While the changes involved in this transition are too extensive to discuss fully in this report, the primary thrust of the licensing initiative is to increase the quality of Ohio's teachers. It is important to understand, however, that some aspects of the new licensure system intended to increase the quality of Ohio's education labor force have the potential to affect the quantity of new teachers in Ohio, at least in the short run.

Recommendations for Next Steps in Understanding Teacher Supply and Demand

The focus of this report was to provide analysis of the current and expected future supply and demand conditions characterizing the labor market for teachers and other education professionals in Ohio. This technical report has identified a number of key areas where Ohio faces challenges. It has not explored in detail the various policy steps necessary to resolve these issues. This process will be the subject of further study. The report recommends the following:

1) An annual report should track trends and changes. The findings in this report are largely either preliminary in nature or based upon a single timeframe of detailed analysis. The Ohio Department of Education will develop an annual report of supply and demand conditions to present data in a systematic and comparable format over a period of years. Such a report should allow for the tracking of trends and changes over time to facilitate informed policy-making.

2) The Integrated Licensure System database should be used to compile data for the annual report. It is imperative that Ohio develop a database to track teachers and other education professionals over time for the express purpose of analyzing supply and demand trends and developing appropriate policy. The Integrated Licensure System database currently under development should be capable of meeting this need.

3) The rate and process of former teachers' reentry into the labor market should be studied. Ohio appears to be approaching a period where increased retirements, combined with potential decreases in new teacher candidates due to strengthened licensing requirements, will place even more pressure on the education labor market. The state needs to plan now to increase recruitment efforts for new teachers, and consider strategies for improving retention rates of existing teachers. A better understanding of the rate at which former teachers re-enter the labor market will aid the planning of those strategies.

4) Recruitment and retention issues for specific types of teachers in specific locations should be examined. Ohio also faces many shortages for specific types of teachers. Understanding issues related to recruitment and retention of minority and special education teachers will help state planning to meet those needs. In addition, further research is necessary to gain understanding of why urban and rural districts have difficulty retaining teachers.

Teacher Supply and Demand in Ohio
Introduction

Ohio's education system contains 613 school districts, 120,000 school teachers, and thousands of additional administrators, counselors, and other professionals. Each year, school districts select new teachers, administrators, and other professionals to fill vacancies in the schools' employment rosters. The hiring process is just one factor impacting the education labor market. Other factors include the higher education programs responsible for training school professionals and the decision-making by which thousands of individual employees choose to remain in the education field, change their vocational focus, or simply change employers within Ohio's public school system.

The education labor market presents researchers with many questions. How many new teachers will the schools need? Are sufficient numbers of prospective teachers training to meet that need? Do some school districts have more difficulty than others in attracting and keeping qualified education professionals? Do some subject areas or occupational specialties present school districts with greater difficulty in filling the need for professional employees?

With so many questions about education labor markets, no single report could address all of them or even most of them in detail. This report presents a kind of sampler of education labor market analyses. It surveys a number of the difficult questions about the marketplace. It provides some general blueprints for future data collection and more detailed investigations than the overview approach of this report permits.

Report comes from economic perspective. At all times the report attempts to maintain objectivity by informing the discussion about school districts' needs for teachers and administrators from an *economic* perspective.

A review of the literature on teacher labor markets as a preparation for this report showed some tendency for education writers to express a tone of disapproval over decisions to leave the education field. In contrast, this report assumes that movement occurs naturally in all labor markets. Decisions about entering or leaving education positions are neither "bad" nor "good" by themselves. However, it is important to understand why they occur in the specific context of Ohio's school system.

Report structure. The report is organized into three main parts. Part 1 focuses on analysis of the demand for educators and is presented in four sections. The first section describes where the need for new teachers exists. The second section suggests some methods for measuring instances where the education labor market does not meet those needs adequately. In the third and fourth sections, specific analyses focus on existing data to identify instances where the existing market fails to match new professionals with school districts' needs.

Part 2 of the report analyzes the supply of teachers in terms of "outflows" – teachers leaving the system through retirement or attrition, and those who move across school

districts. It consists of sections five through seven. The fifth section analyzes a pending increase in retirements of baby boom teachers, while the sixth section quantifies the extent to which new teachers remain in the teaching profession and the extent to which these teachers change employers within education. The seventh section places the teaching profession within the context of the broader labor market in the economy as whole to seek some insights regarding the adequacy of teacher salaries, alternative opportunities for teachers, and about turnover propensity in other professions.

Part 3 of the report, which includes sections eight through ten, analyzes teacher supply "inflows" – beginning teachers entering from teacher preparation programs at Ohio's colleges and universities and re-entry into the labor market by former teachers. Section eight analyzes the higher education "pipeline" of entering teachers and the ninth section analyzes survey results of the "reserve pool" of former teachers not currently teaching. The final section of the report briefly discusses the potential impact on teacher supply deriving from Ohio's transition to a new system of teacher licensure.

The report culminates with a brief section of conclusions and policy recommendations.

This report is the foundation for future study. Thus, the report highlights some important issues, identifies some useful sources of data for future analyses, and begins the process of grounding consideration of Ohio's needs for teachers and other education professionals in terms of economic analysis. The report does not address every issue associated with the education labor market. It does provide a first step for understanding Ohio's labor market for educators and for planning more detailed analyses in the future.

PART ONE:
TEACHER AND ADMINISTRATOR DEMAND ANALYSIS

Changes in Enrollment

Change in statewide enrollment is a key factor that influences the demand for teachers across the state of Ohio. Fluctuations in statewide enrollment will translate directly into changes in the overall demand for teachers. In addition, changes in the *composition* of overall enrollment will translate into changes in the demand for *specific types* of teachers. Special education is an important example of this second linkage between student enrollment and demand for teachers.

Table 1: Total Enrollment (ADM) and Special Education ADM: FY98-FY01

Year	Total Students	% Increase in Total Students	Special Ed. Students	% Increase in Special Ed. Students	Special Ed. Students as % of Total
FY98	1,764,518	--	218,854	--	12.4%
FY99	1,765,780	0.1%	221,169	1.1%	12.5%
FY00	1,757,435	-0.5%	227,195	2.7%	12.9%
FY01	1,760,043	0.1%	229,820	1.2%	13.1%
FY98-01 Change	-4475	-0.3%	10,966	5.0%	--

Data Source: Ohio Department of Education, March 2002.

Table 1 summarizes the changes in both the number of students and special education enrollment over the years FY98 to FY01. While the total number of students is essentially constant over this time period, special education enrollment has increased each year, with a cumulative increase of 5.0%. Consequently, the percentage of total students who are identified with special education needs has increased from 12.4% in FY98 to 13.1% in FY01.

This increase in the number of special education students would be expected to translate into an increase in the demand for special education teachers relative to non-special education teachers. Table 2 and Figure 1 below demonstrate that this has, in fact, been the case in Ohio.

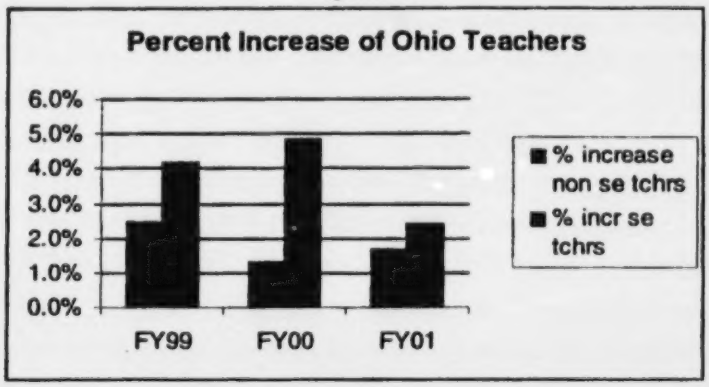
Table 2: Number of Special Education and Non-Special Ed. Teachers: FY98-FY01

Year	Non-Special Ed. Teachers	% Increase in Non-Spec. Ed. Teachers	Special Education Teachers	% Increase in Special Ed. Teachers	Special Ed. Teachers as % of All
FY98	92,753	--	14,904	--	13.8%
FY99	95,013	2.4%	15,525	4.2%	14.0%
FY00	96,270	1.3%	16,275	4.8%	14.5%
FY01	97,899	1.7%	16,664	2.4%	14.5%
FY98-01 Change	5146	5.5%	1760	11.8%	--

Data Source: Ohio Department of Education, March 2002.

While the number of non-special education teachers has increased 5.5% from FY98 to FY01, the number of special education teachers has increased 11.8% over the same time period. Since total enrollment has been constant, the increase in non-special education teachers is likely due to responses to state or local policy efforts, such as those to reduce class size or increase graduation requirements. The increase in special education teachers is consistent with the increase in the number of special education students.

Figure 1



Measuring Demand – Analysis of Job Vacancies

One of the most difficult aspects of the educator labor market to assess is school district demand for specific types of personnel. One direct measure of specific demand is the number and type of job postings advertised in any given year by school districts throughout the state.

Since 1999, the Ohio Department of Education has maintained a website that posts job openings in schools and districts across the state. Posting on this website is optional, and available data suggest that approximately 400 school districts used used this method of advertising over 5800 position openings. While this data is extensive, it may not reflect all job vacancies in the state. The majority of the postings were placed in 2000 and 2001.Some positions were advertised at less than 100% FTE; this was not taken into account in the analysis below as the focus was on the number of vacancies in different areas.

The tables below summarize the number and types of jobs posted in this manner since 1999. Job vacancies posted for certificated personnel were sorted into four broad categories: teaching positions, administrative positions, pupil support services positions, and special education positions. The special education category includes both teaching and pupil support positions, along with a small number of administrator positions. The special education openings have been placed in their own category to highlight the particular need by schools in this area, as is illustrated in Table 3 below.

Table 3: Number and Percentage of Job Postings by Category

Category	Number of Vacancies	Percentage of Total Vacancies
Regular classroom teaching	2784	48%
Special Education	1436	25%
Administration	847	14.5%
Pupil Support Services	738	12.5%
Total	5805	

Data Source: Ohio Department of Education, April, 2002.

Regular classroom teachers by subject area. Tables 4 through 9 provide a more detailed look at the demand for different types of personnel within each of the four broad categories. Table 4 presents data on the number and percentage of teaching openings by subject area. Math and science, two areas of shortage always prominently mentioned as problematic by researchers and practitioners, account for over 20% of the positions advertised.

Table 4: Number and Percentage of Teaching Positions by Subject Area

Subject Area	Number of Vacancies	Percentage of Total Vacancies
Mathematics	325	11.7%
Science	284	10.2%
Elementary	281	10.1%
English/Lang. Arts/Reading	277	9.9%
Vocational/Industrial Arts	264	9.5%
Foreign Language & ESL	236	8.5%
Music	194	7.0%
Gifted Education	154	5.5%
Phys Ed./Health	124	4.5%
Art	110	4.0%
Social Science	105	3.8%
Computer Science & IT	96	3.4%
Other	334	12.0%
Total	2784	

If math and science, both core curricular areas, account for 20% of all teaching positions, the figures in Table 4 would not truly be indicative of a relative shortage in either of these areas. To understand the extent to which job vacancies reflect a shortage of teachers, it is necessary to compare the number of vacancies in different subject areas with the number of teachers needed in each of these areas. Table 5 compares the subject area vacancy data from Table 2 to the total number of courses offered across the state in FY01, in the areas for which this data was available. This approach allows for a more accurate comparison

of the relative need for teachers in core subject areas (English, math, science, and social studies) that all students must take to the need for teachers in non-core areas where fewer courses are offered. Because many elementary teachers are usually assigned to a self-contained classroom, their assignment is reported as a single "course," this approach could not be used to measure the relative need for these teachers.

Table 5: Teaching Vacancies by Subject Area Relative to Total Courses Offered

Subject Area	Total Courses Offered: FY01	Number of Vacancies	Vacancies per 1000 Courses
Foreign Language	22,148	217	9.8
Computer Technology	9,807	96	9.8
Music	28,222	194	6.9
Math	56,237	325	5.8
Science	50,191	284	5.7
Art	33,511	110	3.3
English/Lang. Arts	83,276	218	2.6
Phys Ed & Health	54,939	124	2.3
Social Studies	55,529	105	1.9

Table 5 shows that when vacancies are expressed relative to the number of courses offered, the areas of greatest need differ from what might be included by looking at job openings alone. Foreign languages, computer technology, and music (6th, 12th and 7th in terms of the number of openings) rank as the top areas of instructional need relative to courses offered. Math and science, first and second in terms of number of openings, fall to fourth and fifth place. Figure 2 depicts the contrast in percentage of vacancies with vacancies per 1000 courses.

Figure 2

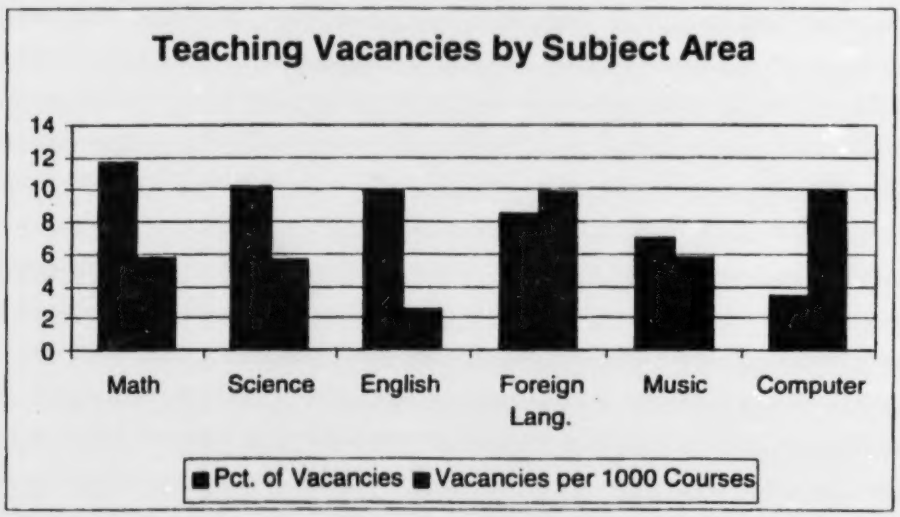


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Table 6 reports the number of vacancies for specific categories of special education personnel. By and large, job openings are most prevalent for personnel needed to work in the areas of the higher incidence handicap conditions (LD, SBH, MH, DH).

Table 6: Number and Percentage of Special Education Positions by Sub-Category

Sub-Category	Number of Vacancies	Percentage of Total Vacancies
Learning Disabled (LD)	222	15.5%
Speech/Language	167	11.6%
Severe Behavior Handicap (SBH)	140	9.7%
Multi-Handicap (MH)	127	8.8%
Developmental Handicap (DH)	116	8.1%
Pre-School	85	5.9%
Intervention Specialist	78	5.4%
Adaptive PE/OT/PT	61	4.3%
Vision/Hearing/Sign Language	42	2.9%
Director/Coordinator	34	2.4%
Unspecified Special Ed.	303	21.1%
Other	61	4.2%
Total	1436	

Special education vacancies. As was the case with foreign language, computer technology, and music, the number of special education vacancies is disproportionately large, relative to the number of teachers needed. Special education teachers comprise only about 14.5% of the teachers in Ohio. However, the number of non-administrative special education vacancies is 1402, which is 28.5% of the total number of teaching and pupil support services vacancies advertised (4924 = 2784 teaching + 738 pupil services + 1402 special ed).

Analysis of the number of openings for personnel to work with particular categories of special education students relative to the number needed is difficult for two reasons. First, as was the case with "regular" teachers, the complexity of the state's certification data makes it difficult to tabulate the number of personnel currently employed in each of the sub-categories. Second, the inclusionary nature of special education, reinforced by the movement from unit funding to weighted pupil funding, prohibits the tabulation of a meaningful measure of courses offered for students by handicap conditions.

While the state special education guidelines and regulations delineate many ratios of personnel to number of students, the complexity of special education prevents a simple calculation of teachers needed by handicap condition. For example, while all of the students receiving speech and language services have an identified "speech" disability, for many, this is their only disability. For other students, speech and language therapy is only a small part of an Individual Education Plan (IEP). Further research in this area will be necessary.

Administrative vacancies. Although the primary focus of this study is teacher supply and demand, job vacancies for administrators are examined briefly in Tables 7 and 8.

Table 7: Number and Percentage of Administrator Positions by Type

Type of Position	Number of Vacancies	Percentage of Total Vacancies
Elementary Principals	135	15.9%
Middle School, Jr. High Principals	66	7.8%
High School Principals	67	7.9%
Unspecified Principals	20	2.4%
Assistant Principals	163	19.2%
Superintendents	49	5.8%
Assistant Superintendents	21	2.5%
Treasurers/Business Managers	55	6.5%
Technology Coordinators	22	2.6%
Other Admin. Positions	249	29.4%
Total	847	

Table 7 lists the number of job vacancies for different administrative positions, while Table 8 includes the number of public schools and districts in need of each of the different administrative positions listed (community schools and JVS districts are not included in Table 6, since the positions advertised appear to be predominantly for administrators in the state's 612 school districts). The number of schools was derived from 2002 State Report Card data

Table 8: Administrator Vacancies by Type, Relative to Number of Jobs

Type of Position	Number of Vacancies	# of School Buildings or School Districts	Vacancies per Building (%)
Middle School/Jr. High Principals	66	672 schools	10.2%
High School Principals	67	704 schools	9.5%
Treasurers/Business Managers	55	612 districts	9.0%
Superintendents	49	612 districts	8.0%
Elementary Principals	135	2260 schools	6.0%
Assistant Principals	163	3636 schools	4.5%
Assistant Superintendents	21	612 districts	3.4%
Total	556	--	

Again, merely counting the number of vacancies without considering the total number of different administrative positions is misleading. While Table 5 suggests that elementary principals are in greater demand than superintendents (135 vacancies to 49), Table 6

suggests that the reverse is in fact the case. Because there are 2260 elementary schools (presumably each with a principal) and only 612 school districts (each with a superintendent), the percentage of openings relative to total jobs is in fact higher for superintendents (8.0%) than for elementary principals (6.0%). By this measure, middle school/ junior high school principals and high school principals are both in shorter supply than are elementary principals. Assistant principals were not coded by type of school, but the total number of assistant positions (163) is over 40% less than the total number of principal positions advertised (288).

Pupil support services. Table 9 provides a breakdown of the type and number of pupil support services positions advertised.

Table 9: Number and Percentage of Pupil Services Positions by Sub-Category

Sub-Category	Number of Vacancies	Percentage of Total Vacancies
Psychologists	184	24.9%
Guidance Counselors	175	23.7%
Coaches & Ath. Directors	164	22.2%
Librarian & Media Specialist	98	13.3%
School Nurse	37	5.0%
Other	80	10.8%
Total	738	

Psychologists, guidance counselors and librarians appear to be in highest demand. Again, the best way to evaluate the data in Table 7 would be to compare the number of vacancies with the total number of these specialists needed across the state.

Finally, the ODE teacher vacancy postings are not dated, so it was impossible to discern new positions from positions that had been posted previously and had not been filled. This distinction is important, insofar as some positions may be characterized by chronic undersupply with many positions left unfilled. Other positions may have a sufficient supply of applicants to fill all positions in a given year, yet are subject to such high turnover that new openings are continually created. This distinction could also be important over time, as districts may stop searching for positions that are chronically unfilled.

While the data here are illuminating, they are also incomplete. With additional research, Ohio could create a "scarcity index" by relating the number of job postings with the total number of filled and unfilled positions. Such an index would establish a common denominator for understanding the relative demand for different kinds of positions.

Measuring Unmet Demand

While the examination of advertised vacancies provides insight into the educator labor market, analysis of these data leaves a number of important questions unanswered. While we gain understanding of the type of personnel that schools and districts are seeking, we still know little about unfilled demand - the needs that remain unmet after teacher personnel have been hired for any given school year.

Unfilled demand can take several forms:

1) A school district wants to offer a particular course, but it cannot offer the course at all because it cannot find a qualified teacher for the course. EXAMPLE: The high school wants to offer calculus and another upper-level math course. It cannot find a qualified teacher.

2) A school district offers a course, but more students want to take the course than the school can accommodate. The district may restrict the number of students taking the course, due to the unfilled need, or allow all interested students to take the course, with the result that the class sizes become too large. EXAMPLE: 60 students want to take calculus, but the district can only offer one section with 25 students. Alternatively, 60 students are crammed into one calculus section.

3) A school district offers a course, but the teacher assigned to the course has inadequate credentials to teach it.

4) A school district has openings for teachers for which an inadequate selection of applicants exists. For example, a district needs to hire 20 elementary school teachers for the coming school year. It receives only 25 applications for all 20 positions. This leaves the district with very little choice in hiring. It also suggests that by the time the district reaches the 20th person hired, some compromise in quality has occurred.

The measurement of these aspects of unfilled demand would require different approaches:

1) The identification of situations where a school district wants to offer a course, but cannot do so, will not result directly from EMIS or teacher certification data. The data cannot report a course that is not offered. Indirect measurement of this kind of unfilled demand could use one or more of the following techniques:

a) Survey administrators – ODE could ask districts to report each decision to omit a course due to the inability of the district to hire a qualified

teacher. Alternatively, ODE could attempt to obtain the same kind of information by random surveys of a representative sample of districts.

b) Curriculum comparisons – ODE could compare the number and variety of course offerings between comparable districts for the purpose of finding omitted courses. This approach requires the inference that the failure of a district to offer a course that another district does offer results from a failure in the labor market, i.e., unfilled demand for a teacher.

2) Course comparisons – A comparison of the number of sections of the same course offered in different districts with similar enrollment would tend to show that the district with fewer sections is understaffed.

3) Certification analysis – If a district assigns a teacher with inadequate credentials to teach a course, it suggests unfilled demand. It may also reflect the rational response of a school district to a situation where student demand for a course is too low to justify a full-time teacher. Measurement of this type of unfilled demand would require district-by-district analyses of the match between positions and teacher credentials.

4) Applications analysis – If districts do not receive an adequate number of applications to offer a meaningful choice at the hiring stage, employment statistics will not reflect this problem. ODE would need to collect additional data from districts to measure the number of applications per open position. This data collection could occur on a comprehensive basis with all districts required to provide the information, or it could rely upon a representative sample of districts.

5) Pupil/teacher ratio analysis – High pupil /teacher ratios could indicate a problem of unfilled demand. The measurement of this problem would require an analysis designed to identify high pupil/teacher ratios in specific subjects or grade levels. It could be supplemented by application data as suggested in the previous paragraph.

Temporary certification and licensure analysis. While the examination of vacancies advertised provides understanding of the type of personnel that schools and districts are seeking, it explains little about needs that remain unmet after personnel have been hired for any given school year. One approach to measure unmet demand has been the analysis of temporary certificates and licenses granted by the state of Ohio. Temporary licenses are requested when schools and districts have been unable to fill a position with an appropriately certificated or licensed teacher. The number of temporary licenses requested is an indirect measure of unmet demand, in that an individual with the standard credential required is not available. It can also reflect a staffing decision by the district for a course for which there is insufficient student demand to merit a full-time teacher. Instead, the district may assign the course to a teacher whose primary teaching responsibilities and qualifications are in another subject area.

The data available for this analysis comes from the Ohio Department of Education's database, designed for the administrative purpose of verifying and renewing teacher certificates and licenses rather than for research or policy purposes. The changes in the certification and licensure system occurring during the FY 00 and FY 01 year limit the utility of any trend analysis of this data. In addition, data available for the years FY 97 through FY 99 include all kinds of temporary certificates, including those issued for substitute teachers. The transitional data from FY 00, the first year of the new system, was omitted; data from FY 01 includes no counts of licenses issued for substitute teachers and can best be used as a baseline for future work. Thus, the findings of this section should be considered to be preliminary rather than final in nature, and the most useful information is the distribution of temporaries among certificate and license types, rather than total numbers issued in any one type.

Table 10 reports the number of licenses issued in each of the available years for four categories of education personnel; K-12 teachers, building administrators (principals and superintendents), pupil support services personnel, and administrative specialists (business managers, human resources, community relations, etc.).

Table 10: Temporary Certificates and Licenses by Year and Category, FY97-01

Category	FY97 Includes subs	FY98 Includes subs	FY99 Includes subs	Change in data definition	FY01 No subs
K-12 Teachers	9,758	12,174	15,179		3,638
Building Administrators	190	255	345		390
Pupil Support Services	489	475	536		639
Administrative Specialists	7	14	20		142
Totals	10,444	12,918	16,080		4,809

Data Source: Ohio Department of Education, April, 2002.

There are two obvious patterns evident in Table 8. First, more than 90% of temporary certificates are issued to K-12 teachers. As teachers comprise the majority of the labor force, this is not surprising. Second, there was a very large increase in temporary certificates issued to instructional personnel between FY97 and FY99. The differences between FY 99 and FY 01 data can be attributed to the elimination of certificates for substitute teachers.

Tables 11 through 15 provide a more detailed breakdown of temporary certificates issued in the years studied. . This more detailed analysis also is helpful in demonstrating the effects of Ohio's new licensure system.

Table 11: Instructional Temporary Certificates and Licenses, FY97-FY01

Licensure Category	FY97 Includes subs	FY98 Includes subs	FY99 Includes subs	Change in data definition	FY01 No subs
Pre-Kindergarten Certificate	28	54	79		28
K-3 Certificate	73	84	112		3
K-8 Certificate	563	601	775		21
Elementary 1-8 Certificate	706	820	926		30
Middle School 4-9 Certificate	91	122	202		10
High School 7-12 Certificate	5,620	7,511	9,721		147
Comprehensive HS 7-12 Certificate	91	53	45		5
Special K-12 Certificate	1,122	1,358	1,673		88
Education of Handicapped K-12 Cert.	1,440	1,581	1,653		528
Vocational Certificate	52	44	63		194
Adult Education Certificate	5,860	5,996	5,952		6,146
Early Childhood PK-3 License					*81*
Middle Childhood 4-9 License					*70*
Adolesc. - Young Adult 7-12 License			*2*		*344*
Multi-Age K-12 License			*3*		*233*
Intervention Specialist License			*4*		*1,731*
EC PK-3 Intervention Spec. License					*153*
Total K-12 Certificates & Licenses	9,758	12,174	15,179		3,638
Total Certificates & Licenses	15,646	18,224	21,210		9,812

Table 11 reports the number of temporary certificates issued to instructional personnel in 11 certificate categories and six licensure categories (licensure categories are delineated in *Italics*). The table makes clear that approximately 6000 adult education temporary certificates are consistently issued annually. Because adult education is both part-time by nature and geared towards a population of students outside the K-12 system, interpretation of temporary certification data as indicative of shortages is likely not warranted, and will not be discussed further in this study.

Table 12 uses the data from Table 9 to demonstrate an increasing reliance on temporary certificates and licenses for special education instructors (education of the handicapped certificates and PK-3 and general intervention specialist licenses). While the number of temporary certificates and licenses for other K-12 personal increased and then decreased, temporary credentials for special education personnel steadily increased. As a result, the

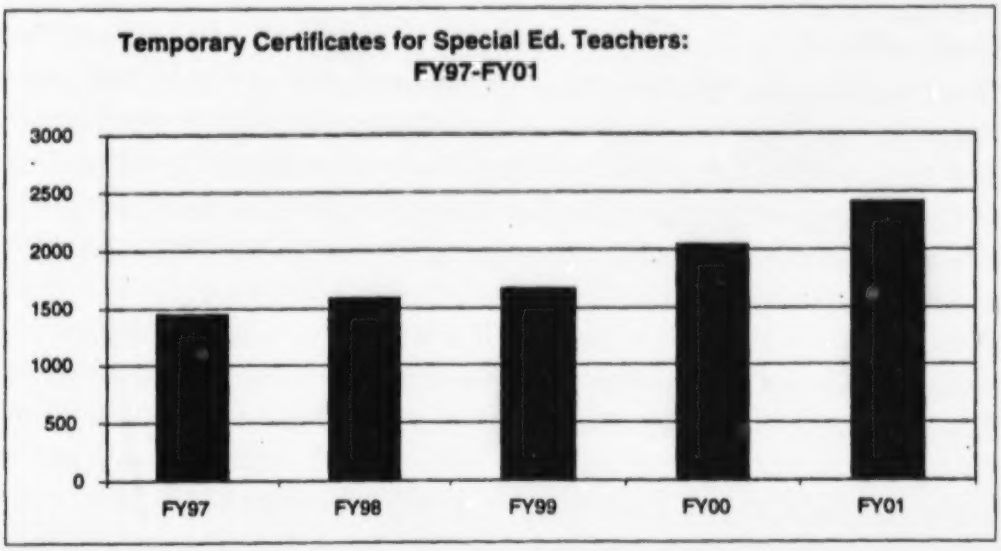
percentage of temporary special education licenses increased dramatically from FY97 to FY01. This trend is also depicted in graph form in Figure 3 below.

Table 12: Temporary Certificates and Licenses for Special Education Instructors

Year	K-12	Special Ed. Teachers	% Special Ed. Temp. Licenses
FY97	9,758 teachers and subs	1440	14.8%
FY98	12,174 teachers and subs	1581	13.0%
FY99	15,179 teachers and subs	1657	10.9%
FY01	3,638 teachers	2412	66.3%

While the inclusion of substitute teachers in some of the counts above may limit their utility, increased reliance on temporary certificates for special education personnel is entirely consistent with trends reported by school district personnel regarding difficulties in filling special education positions.

Figure 3



Tables 13 and 14 present more detailed data on temporary certificates and licenses for building administrators and pupil support services personnel. Temporary credentials for principals and superintendents more than doubled from FY97 to FY01. While it appears that much of the increase was due to increases in temporary certificates for elementary and high school principals, the transition to the new licensure system makes it difficult to know this for sure. The reason is that the six categories of the old certification system have been consolidated into a single building administrator license category, rendering it impossible to discern the exact positions of those with the temporary licenses.

Table 13: Administrator Temporary Certificates and Licenses, FY97-FY01

Licensure Category	FY97	FY98	FY99	FY00	FY01
Elementary (K-8) Principal Certificate	63	83	118	111	43
Middle Sch. (4-9) Principal Certificate	38	41	57	39	9
High Sch. (7-12) Principal Certificate	67	101	123	95	36
Superintendent Certificate	16	16	30	29	39
Local Superintendent Certificate	1	6	6	5	3
Asst. Superintendent Certificate	5	8	8	13	8
Building Administrator License			*3*	*102*	*252*
Total Certificates & Licenses	190	255	345	394	390

The situation is similar with regard to pupil support services personnel. The temporary certificates data show that nurses, speech pathologists and psychologists are the most common categories, however, by FY01 95% of the temporary credentials are listed under the single category of Pupil Support Services License. Thus, it is impossible to identify the specific positions responsible for the 30% increase in temporary pupil support services credentials from FY97 to FY01.

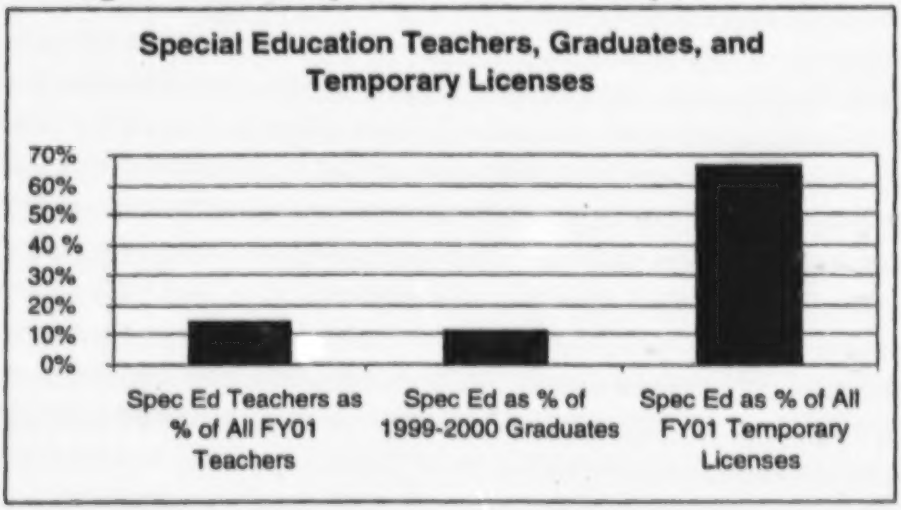
Table 14: Pupil Support Services Temporary Certificates and Licenses, FY97-FY01

Licensure Category	FY97	FY98	FY99	FY00	FY01
School Counselor Certificate	1	1	13	7	
School Nurse Certificate	263	259	308	218	25
School Psychologist Certificate	91	82	79		
Speech-Lang. Pathologist Certificate	85	86	87	53	1
School Audiologist Certificate				1	
Occupational Therapist Certificate	1	1			1
Vocational Director Certificate	2	2	2	4	3
Supervisor Certificate	46	43	27	27	
School Social Worker Certificate		1			
School Social Worker License			*1*		
Pupil Services License			*19*	*338*	*609*
Total Certificates & Licenses	489	475	536	648	639

Perhaps the most important conclusion from Tables 13 and 14 is that, as Ohio continues to study issues pertaining to the labor market for educators, it will be important to maintain disaggregated data on specific types of education personnel.

The shortage of special education teachers facing Ohio can be summarized by the data depicted in Figure 4 below. In FY01, special education teachers comprise 14.5% of the total number of teachers in the state. However, the teachers graduating from Ohio colleges in 2000 (who were eligible to join the teaching force in the FY01 school year) includes only 11.1% who can teach special education students (this data is discussed in more detail later in this report). Consequently, school districts must rely increasingly on filling special education positions with personnel possessing temporary certificates and licenses.

Figure 4 – Percent Special Ed. Teachers, Temps, and Grads



PART 2: TEACHER SUPPLY ANALYSIS - OUTFLOWS

While the first part of this study examined the demand aspects of the educator labor market in Ohio, the second and third parts of this study examine the supply aspects. Part 2 of the report examines outflows of teachers from the labor market due to retirement and attrition. Part 3 of the report examines inflows into the labor market, including beginning teachers graduating from Ohio's institutions of higher education and re-entry into the labor market by experienced teachers who have taken time off from their jobs.

Pending Retirements

The number of educators expected to retire is obviously a critical factor influencing the future demand for teachers and administrators. In this context, the impact of America's post-World War II "baby boom" is of particular interest. In the 1950s and early 1960s, the baby boom initially increased the need for teachers due to the marked increase in the number of students. Its impact in the year 2002 lies in the pending retirement of the many teachers who were hired to meet this abnormally large need.

Table 15 depicts the progression of the baby boom pool of teachers over time. The number of teachers in Ohio between 41 and 50 years of age is clearly much higher in FY96 than in FY01. Additionally, the retirement of many of these teachers can be seen by noting the 40% dropoff from 14,713 teachers age 51-55 in FY96 to 8,769 teachers age 55-60 in FY01. This trend extends further as the 6,453 teachers age 56-60 in FY96 decreases by 62% to 2447 teachers age 61-65 in FY01.

Table 15: Teacher Age Distribution: FY96 and FY01

Age Range	Number of Teachers by Age: FY96	Number of Teachers by Age: FY01
22-25 yrs old	3,466	5,848
26-30 yrs old	12,082	16,857
31-35 yrs old	10,886	15,095
36-40 yrs old	12,348	12,311
41-45 yrs old	20,024	14,293
46-50 yrs old		
51-55 yrs old		
56-60 yrs old		
61-65 yrs old	2,192	
66-70 yrs old	474	456
71-75 yrs old	64	87
75+ yrs old	14	17
Total Teachers	**108,410**	**120,361**

Data Source: Ohio Department of Education, April, 2002

Figures 5, 6, and 7 depict the age distribution of teachers in FY96 and FY01 graphically.

Figure 7

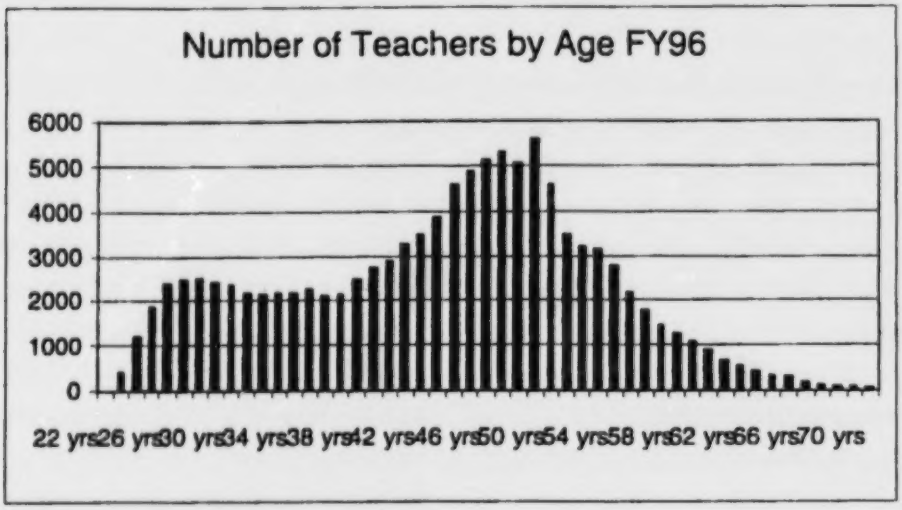
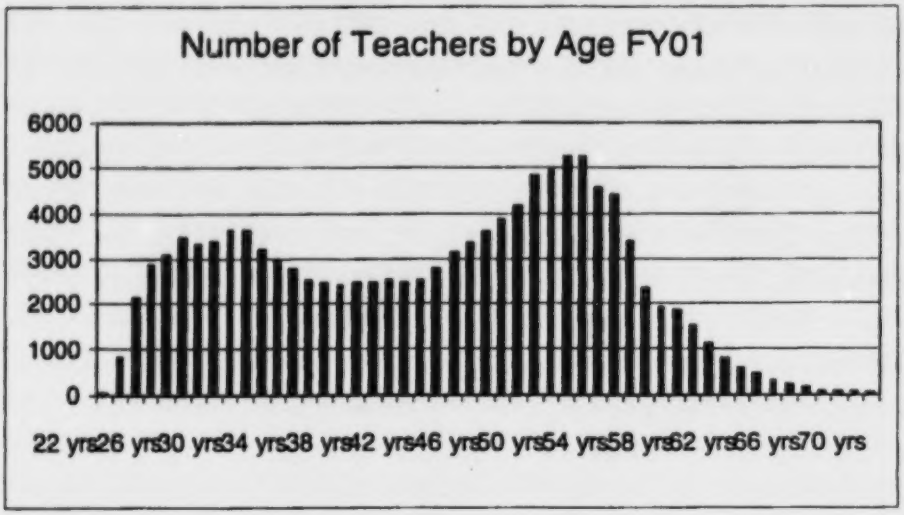


Figure 8



Figures 7 and 8 clearly depict a hump-shaped age distribution of teachers for both FY96 and FY01. Even casual inspection of the two graphs indicates that the large hump representing teachers between the ages of 42 and 54 in FY96 is moving rightward over time and appears as a hump between the ages of 47 and 57 five years later. Figure 8 below places the age distributions in FY96 and FY01 on the same graph, making this rightward progression of teachers nearing retirement age even more clear.

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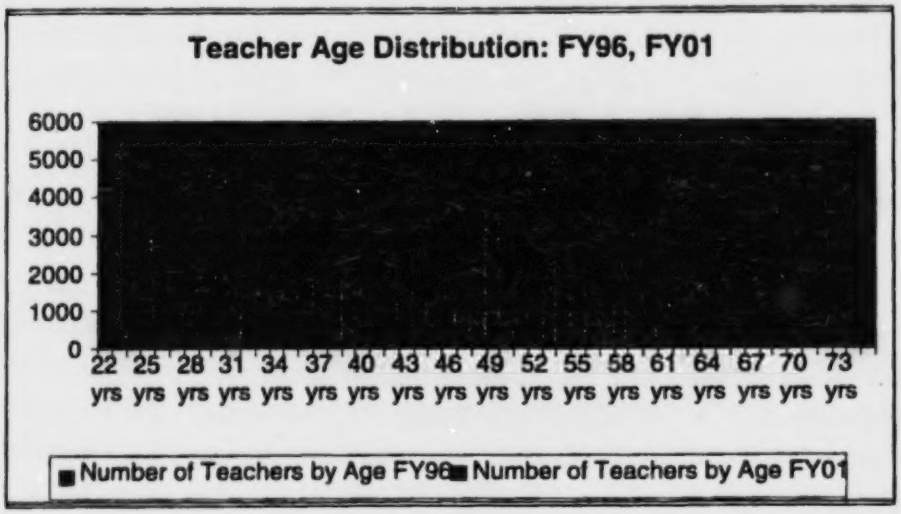
Figure 9



What is also made clear by Figure 9 is that there are many more younger teachers in FY01 than in FY96. This suggests not only that more teachers are being employed in FY01, but also that the expected surge in the retirement of baby boom teachers has already begun.

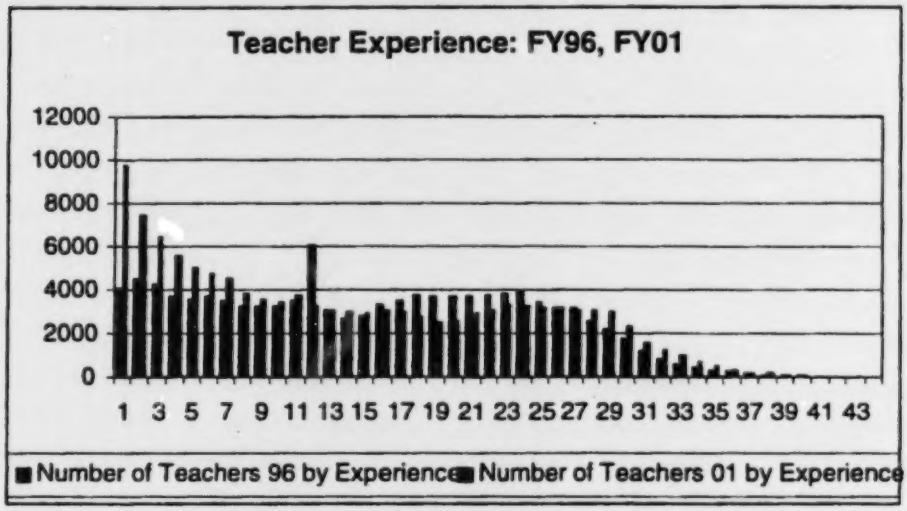
Table 16 and Figure 10 reinforce the age distribution findings by examining the experience levels of teachers in FY96 and FY01.

Table 16: Teacher Experience Distribution; FY96 and FY01

Years of Experience	Number of Teachers by Experience: FY96	Number of Teachers by Experience: FY01
0-4 years		
5-9 years	16,847	20,072
10-14 years	18,160	16,013
15-19 years	17,913	13,941
20-24 years	18,540	15,783
25-29 years		14,599
30-34 years	3,308	
35-39 years	602	749
40-44 years	74	74
45+ years	7	13
Total Teachers	**108,412**	**120,365**

Table 18 graphs teacher experience over the same years and, not surprisingly, reveals the same trends as were evident in Table 16. The data show a 69% increase in the number of teachers with 0-4 years of experience from FY96 to FY01. There is also a 60% decrease in the number of teachers who had 25-29 years of experience in FY96 (12,796) to only 5,033 teachers with 30-34 years of experience in FY01. Because retirement benefits steadily increase up to 30 years of experience, many teachers retire at or shortly before this level. Figure 9 provides a graphic comparison of this data for the two years under study.

Figure 10


Teacher Experience: FY96, FY01
12000
10000
8000
6000
4000
2000
0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43
Number of Teachers 96 by Experience
Number of Teachers 01 by Experience

Data Source: Ohio Department of Education, April, 2002

The looming increase in the number of pending retirements among Ohio's current educator workforce suggests a need for increases in the number of new teachers prepared in the state in the near future.

Attrition and Mobility

One factor that contributes to teacher supply issues is the movement of teachers away from teaching – attrition. Another is the movement of teachers from district to district or from one subject area to another - mobility.

This section of the report estimates the attrition rate for teachers who began teaching in Ohio public schools in 1997. For purposes of this analysis, a "teacher" means a person with a position assignment of 205 (regular teaching assignment), 206 (special education/learning center teaching assignment), or 207 (vocational education teaching assignment). Only teachers listed in one of the 611 "regular" school districts that existed continuously for the five years were included. The analysis defined a "beginning" teacher as a person with a zero entry in the "authorized experience" field of the EMIS database.

Estimated attrition rate for beginning teachers in 1997. Data regarding 3,376 beginning teachers were extracted from the EMIS for the 1996-97 school year. A match of these beginning teachers from 1997 with the EMIS records for the 2001-02 school year made it possible to determine how many teachers from the 1997 beginners' cohort remained in the system in 2002.

Table 19 shows the results of this attrition analysis. In this context, the term "attrition" refers to teachers who leave the Ohio public school system entirely rather than those who move from one district to another.

Table 19: Beginning Teachers in 1997 and after Five Years

	1997	2002	Difference	Percent Difference
Teachers	3,376	2,420	956	28%

The table shows how many teachers, who began teaching in 1997, remained in Ohio public schools by the sixth year following their entrance into the system. The first column shows that 3,376 such beginners started in 1997. The second column shows that 2,420 of those beginners in the 1997 column were still teaching in 2002. Therefore, 956 teachers departed teaching in Ohio public schools during the five-year period. The final column shows the attrition percentage obtained by dividing the 956 departures by the original number of 3,376 beginners. Slightly more than one of every four of the 1997 beginning teachers had left the system within five years.

The results shown in Table 18 are remarkably consistent with the recent study of other midwestern states reported in *NCREL Policy Issues*. An analysis in the NCREL publication shows that, out of 11,787 beginning teachers in four midwestern states in

1996, 28% had departed teaching within five years.[1] The Ohio data indicate the same attrition rate of 28%.

Table 20 breaks down the information in Table 19 by the three types of teachers.

Table 20: Beginning Teachers in 1997 in the Same Position Assignment after Five Years

Position Assignment	1997	2002	Difference	Percent Difference
Regular Teaching	2,704	1,928	(776)	29%
Special Education	586	340	(246)	42%
Vocational Education Teaching	86	62	(24)	28%
Other Positions	-	90	90	
Total	3,376	2,420	(956)	28%

The table divides the results from Table 18 into different categories of teaching: "Regular" teachers with an EMIS assignment code 205, special education teachers with a 206 assignment code, and vocational education teachers with a 207 assignment code. The first row shows that 2,704 beginning teachers started in "regular" classroom assignments. Of those teachers, 1,928 held "regular" teaching assignments in 2002. The reduction of 776 teachers results in a 29% attrition rate. Vocational education teachers show a similar attrition rate of 28%. Special education teachers show a much higher attrition rate of 42%. However, some of this "attrition" represents movement between position assignments. For example, some of the 246 special education teachers in 1997 who no longer held a 206 position assignment in 2002 remained in the system in a different position assignment. Therefore, Table 19 shows how many teachers remained in the *same position assignment* in 2002 as in 1997.

Table 21 shows a slightly different perspective on the same data. – it shows the number of teachers who remain in the system, regardless of their beginning assignment.

Table 21: Teachers Remaining in 2002 by Position Assignment in 1997

Position Assignment In 1997	1997	2002	Difference	Percent
Regular Teaching	2,704	1,937	(767)	28%
Special Education	586	422	(164)	28%
Vocational Education Teaching	86	61	(25)	29%
Total	3,376	2,420	(956)	28%

This table reports how many teachers in the 1997 cohort remained in a teaching position through 2002. The chart is organized according to the 1997 position assignment. For example, of 2,704 teachers assigned to "regular" teaching positions in 1997, 1,937 remained teaching in public schools in some capacity by 2002. This table shows a more

[1] "Who Stays, Leaves, and Moves?" by Neil D. Theobald and Robert S. Michael, NCREL Policy Issues, December/January 2001.

encouraging result with respect to special education teachers. About the same percentage remained in the system as in the case of other teachers. A question unanswered by this data is how many remained in special education teaching positions of some kind, how many had moved into "regular" classroom assignments, and how many were now administrators.

Therefore, Table 21 shows how many teachers remained in 2002 from each teacher's starting assignment in 1997 regardless of the specific position assignment held by that teacher in 2002.

The results in Tables 20 and 21 resemble the findings of Theobald and Michael in the NCREL report. The results for regular teachers are not too different from the 26% (elementary teachers) and 29% (high school teachers) published by NCREL. The results for vocational education teachers are somewhat lower: 28% in Table 20 compared to 37% in NCREL. The results for special education are similar. NCREL's report shows a special education attrition rate of 26% compared to the 28% Ohio attrition rate shown in Table 21.

Estimated transfer rate for beginning teachers in 1997. In addition to teachers who leave the public school system entirely, other teachers move from an assignment in one school district to an assignment in another district. Theobald and Michael call teachers who depart from the system entirely, "leavers," and teachers who transfer between districts, "movers." In their study of midwestern states, about 28% of beginning teachers left after five years and another 23% moved.

The data from Ohio school districts compiled from the EMIS database enabled an estimate of the number of teachers who moved among Ohio school districts in addition to the attrition of those who left entirely. The Ohio "movers" amounted to 620 of the original 3,376 teachers with zero experience hired in 1997. While teacher mobility may create a problem in itself, not all movement necessarily means a loss for a school district. The data show that many districts experienced mobility in both directions. Some teachers moved out while other teachers moved in. A net mobility rate shows the number of movers after movement of teachers into a district is offset against teachers who move out of the same district. When this offsetting process occurs, the net mobility of teachers declines from 620 to 373.

Table 22 summarizes the data on teacher mobility.

Table 22: Beginning Teachers in 1997 Working in a Different School District after Five Years

	1997 Beginners in 2002	Moved to a Different District by 2002	Net Teacher Mobility	Total Mobility Rate
Teachers	2,420	620	373	18%

The first column shows the number of teachers who began with zero experience in 1997 and remained in the public school system in 2002. The second column shows that 620 of these teachers moved to a different school district by 2002. These "different districts" include movement to JVS or MR/DD facilities, although teachers who began in those facilities are not included in the original 3,376 beginners. "Net Teacher Mobility" shows the net amount of teacher losses by school districts, computed by subtracting the number of experienced teachers who moved into a district from the number of experienced teachers who moved to a different school district.

For example, of 107 teachers who began teaching in Cleveland with zero experience in 1997, 46 left the public school system entirely (attrition) and 12 moved to a different district (mobility). When these leavers and movers are subtracted from the number of 1997 beginners, Cleveland had 49 of the original new teacher cohort from 1997 in 2002. However, seven teachers who began in a different district in 1997 moved into the Cleveland district between 1997 and 2002. As a result, Cleveland's *net* mobility equaled 5 rather than 12.

The fourth column of Table 22 shows teacher mobility as a percentage of the original 3,376 beginners in 1997. This percentage equals the quotient obtained by dividing teacher mobility (620) by the total number of beginners (3,376). Net mobility has meaning in the consideration of individual districts or groups of districts but not on a statewide basis. Statewide, the "net mobility rate" (not shown in Table 4) is not meaningful. The number of teachers moving out of districts equals the number moving into some other district, so that the net rate statewide would equal zero.

Theobald and Michael did not compute a net mobility rate. Their gross mobility rate equaled 23% of the 11,787 beginners in their four-state study. The Ohio mobility rate compares favorably with the other study with 18% of beginners changing school districts in Ohio.

The following series of tables shows the attrition and mobility statistics for selected school districts or groups of school districts. In many individual school districts, the results of the analysis are meaningless, especially as expressed in percentage terms, because small districts may hire only a small number of zero experience teachers in any given year. Thus, if a school district hired one beginner in 1997, and that teacher left or moved, the attrition or mobility rate equals 100%. Similarly, if a small district did not hire anyone from the 1997 cohort of beginners, but one teacher from that cohort transferred into the district 1999, the district's "mobility" percentage would equal an infinite number. Obviously, such results do not provide much insight. However, by accumulating the experience of a number of small districts or by focusing on a few districts with large numbers of 1997 beginners, the results become more meaningful.

Table 23 begins with the "urban 21" school districts. This group of districts was identified by law to include districts based on their concentration of students with social

problems and performance gaps. The group includes the largest eight urban districts, as well as smaller cities and suburbs. The first column of the table shows the name of the district. The second column shows the number of teachers with zero experience hired in 1997. The third column shows how many teachers from the 1997 cohort of beginners remained by 2002. The fourth column shows how many teachers left the Ohio public school system during the intervening five years. The fifth column shows how many of the 1997 beginners moved out of each district. The sixth column shows how many 1997 beginners moved into each district. The last three columns show the percentage of leavers (attrition), the percentage of teachers who moved out, and the percentage of teachers who moved out less the number teachers who moved into each district (net mobility rate) from the 1997 cohort.

For example, Akron hired 42 beginning teachers in 1997. By 2002, 29 teachers who began in 1997 remained. Thirteen of the original 42 beginners left teaching. Four of the 1997 Akron beginning teachers moved to other school districts in Ohio, but four teachers who began elsewhere in 1997 moved into Akron over the same period. Therefore, Akron shows a 31% attrition rate, a 10% mobility rate, and a 0% net mobility rate. The attrition rate slightly exceeded the statewide average, but the mobility experience in Akron was somewhat less than average.

Table 23: Attrition and Mobility Rates for Beginning Teachers in 21 Urban Districts

	1997 Zero Exp.	2002	Leavers	Move-Out	Move-In	Attrition %	Mobility %	Net Mobility %
AKRON	42	29	13	4	4	31%	10%	0%
CANTON	21	17	4	1	1	19%	5%	0%
CINCINNATI	8	10	4	0	6	50%	0%	-75%
CLEVELAND	107	55	46	12	6	43%	11%	6%
CLEVELAND HTS-UNIV. HTS	50	36	11	4	1	22%	8%	6%
COLUMBUS	120	81	52	6	19	43%	5%	-11%
DAYTON	23	10	10	4	1	43%	17%	13%
EAST CLEVELAND	1	0	0	1	0	0%	100%	100%
ELYRIA	13	7	5	3	2	38%	23%	8%
EUCLID	2	2	0	1	1	0%	50%	0%
HAMILTON	18	8	6	7	3	33%	39%	22%
LIMA	19	14	6	4	5	32%	21%	-5%
LORAIN	34	24	10	1	1	29%	3%	0%
MANSFIELD	8	7	1	1	1	13%	13%	0%
MIDDLETOWN	31	12	8	11	0	26%	35%	35%
PARMA	31	23	6	6	4	19%	19%	6%
SOUTH-WESTERN	54	33	19	8	6	35%	15%	4%
SPRINGFIELD	30	17	6	9	2	20%	30%	23%
TOLEDO	97	45	40	14	2	41%	14%	12%
WARREN	13	7	4	4	2	31%	31%	15%
YOUNGSTOWN	5	1	3	1	0	60%	20%	20%
URBAN 21 TOTAL	727	438	254	102	67	35%	14%	5%

A negative number in the "Net Mobility %" column means that more teachers moved into a school district from the 1997 beginners than moved out of the district from the same group.

Cumulatively, the 21 urban districts registered attrition somewhat above the statewide average (35% versus 28%). However, the mobility rate for these districts was less than the state average. While overall, 18% of Ohio's teachers moved in the first five years, only 14% of those who began in one of the urban districts moved. The net mobility rate was also low. Urban districts succeeded in hiring some of the movers from the 1997 beginners. In both Cincinnati and Columbus, the number of teachers who moved in exceeded the number who moved out.

Table 24 shows the same kind of data as Table 23, but it highlights the experience of six Appalachian counties. Rather than show individual school districts, the table provides information about the cumulative experience of the school districts in each of the counties included in the table. With many small school districts in these counties, a countywide perspective provides a more meaningful table than a table based on the experience of individual school districts.

Table 24: Attrition and Mobility Rates for Beginning Teachers in the 27 School Districts of Six Appalachian Counties between 1997 and 2002

APPALACHIAN COUNTIES	1997	2002	Leavers	Move-Out	Move-In	Attrition %	Mobility %	Net Mobility %
ADAMS	18	7	5	8	2	28%	44%	33%
ATHENS	40	18	19	5	2	48%	13%	8%
JACKSON	2	6	0	0	4	0%	0%	-200%
LAWRENCE	17	16	1	1	1	6%	6%	0%
SCIOTO	15	11	3	7	6	20%	47%	7%
VINTON	10	4	5	1	0	50%	10%	10%
TOTAL	102	62	32	22	14	31%	22%	8%

Cumulatively, the school districts in these counties show a higher than average attrition rate. Considerable variation appears from county to county with Jackson County registering no attrition and a net gain from teachers moving into the districts there. At the same time, Athens County school districts suffered 48% attrition plus 8% net mobility losses for a cumulative loss of 56% of the 1997 beginning teachers. With relatively small numbers of new teachers hired in Jackson and Vinton Counties, it is difficult to know whether the experience of the period covered here shows a representative example of the experience in those districts over the long run.

Table 25 shows a similar analysis of rural school districts, but it reports a selection of counties from less impoverished areas of the state.

Table 25: Attrition and Mobility Rates for Beginning Teachers in 49 School Districts of Eight Non-Appalachian Rural Counties between 1997 and 2002

NON-APPALACHIAN RURAL COUNTIES	1997	2002	Leavers	Move-Out	Move-In	Attrition %	Mobility %	Net Mobility %
AUGLAIZE	11	9	2	4	4	18%	36%	0%
CHAMPAIGN	13	11	3	2	3	23%	15%	-8%
CRAWFORD	14	12	4	2	4	29%	14%	-14%
DARKE	26	14	3	12	3	12%	46%	35%
HANCOCK	20	15	7	3	5	35%	15%	-10%
HARDIN	22	14	2	12	6	9%	55%	27%
HOLMES	18	14	4	1	1	22%	6%	0%
PUTNAM	14	12	3	3	4	21%	21%	-7%
TOTAL	**138**	**101**	**28**	**39**	**30**	**20%**	**28%**	**7%**

The 20% attrition rate for school districts in these counties falls well below the state average of 28%. At the same time, the mobility rate in these districts exceeds the state average by ten percentage points (28% compared to the 18% average). In spite of this high mobility rate, the net mobility rate remained in single digits. Thus, while the teachers in these districts show a greater than average tendency to change districts, the movement out of these counties is not much greater than the movement into them.

Table 26 continues the series of selected attrition and mobility experiences by collecting data from five "exurban" counties. The table includes the school districts from a county on the fringe of each of five major cities.

Table 26: Attrition and Mobility Rates for Beginning Teachers in 36 School Districts of Five Exurban Counties between 1997 and 2002

EXURBAN COUNTIES	1997	2002	Leavers	Move-Out	Move-In	Attrition %	Mobility %	Net Mobility %
CLERMONT	73	45	20	19	11	27%	26%	11%
DELAWARE	114	78	32	14	10	28%	12%	4%
GREENE	28	18	10	6	6	36%	21%	0%
MEDINA	23	25	4	6	12	17%	26%	-26%
WOOD	58	47	10	7	6	17%	12%	2%
TOTAL	**296**	**213**	**76**	**52**	**45**	**26%**	**18%**	**2%**

These counties include a mix of suburban districts and rural districts. The attrition rate for the districts in these counties falls only two points below the statewide attrition rate, and the mobility rate exactly equals the state average. A net mobility rate of only 2% shows that teachers are almost as likely to move into these districts as to move out of them.

Table 27 shows the experience of the dozen richest school districts after excluding island districts.

Table 26: Attrition and Mobility Rates for Beginning Teachers in the 12 Wealthiest School Districts between 1997 and 2002

12 WEALTHIEST DISTRICTS	1997	2002	Leavers	Move-Out	Move-In	Attrition %	Mobility %	Net Mobility %
Beachwood CSD	1	1	0	1	1	0%	100%	0%
Cuyahoga Heights LSD	3	4	0	1	2	0%	33%	-33%
Orange CSD	2	3	0	0	1	0%	0%	-50%
Brooklyn CSD	5	5	1	1	2	20%	20%	-20%
Independence LSD	1	1	0	0	0	0%	0%	0%
Westlake CSD	0	3	0	0	3	NA	NA	NA
Mayfield CSD	7	7	0	0	0	0%	0%	0%
Sycamore Community CSD	38	29	13	2	6	34%	5%	-11%
New Richmond EVSD	13	7	4	2	0	31%	15%	15%
Plain LSD	1	1	0	1	1	0%	100%	0%
Benton Carroll Salem LSD	2	2	0	1	1	0%	50%	0%
Danbury LSD	4	3	1	0	0	25%	0%	0%
Total	77	66	19	9	17	25%	12%	-10%

For these individual school districts, the statistics on the table do not provide a reliable picture because such small numbers are involved. Half of these districts hired only one or two beginners in 1997. Cumulatively, the totals for all 12 districts may offer some insight into the experience of wealthy districts generally. Two observations deserve emphasis. First, the attrition rate in these wealthy districts does not fall much below the state average. With attrition of 25%, these districts only lowered attrition by three points below the general experience of all districts. Second, mobility rates for these districts improve considerably on the state average. Clearly, once a teacher obtains a position in one of these districts, he or she is unlikely to leave it for another school district. Consistent with this observation is the fact that almost twice as many teachers (17) moved into these districts from among the 1997 beginners as moved out (9).

Table 28 summarizes the total line from the five preceding tables.

Table 28: Summary of Attrition and Mobility Totals from Tables 23 Through 27

	1997	2002	Leavers	Move-Out	Move-In	Attrition %	Mobility %	Net Mobility %
21 Urban Districts	727	438	254	102	67	35%	14%	5%
6 Appalachian Counties	102	62	34	22	16	33%	22%	6%
8 Rural Counties	138	101	28	39	30	20%	28%	7%
5 Exurban Counties	296	213	76	52	45	26%	18%	2%
12 Wealthy Districts	77	66	19	8	16	25%	10%	-10%
Statewide 611Districts	3,376	2,420	956	620	373	28%	18%	11%

The table shows that urban districts and poor rural districts have higher than average attrition rates. In contrast to expectations, urban districts do not show high rates of mobility. In other words, if a beginning teacher hired by an urban school district stays in the public school classroom, he or she shows less than average likelihood to move to another school district after five years of teaching. Appalachian counties show relatively high attrition and relatively high mobility rates. However, mobility does not necessarily mean a one-way flow away from Appalachia as shown by the net mobility rate of 6%, a less than average net mobility rate. Non-Appalachian rural districts show the lowest rate of attrition and the highest rate of mobility. Again, mobility does not appear to mean a flow from rural to non-rural districts. The net mobility rate of these rural districts falls below the state average and far below the mobility rate for any of the districts individually.

The exurban counties and the wealthiest districts both register attrition rates superior to the statewide average, but the difference is quite small. The wealthiest districts clearly show reduced mobility rates. As one would anticipate, teachers appear to value a position in these districts highly and do not leave these districts once they obtain a position in them.

Department of Education district typology. The Department of Education has developed a typology for classifying the State's school districts according to common demographic characteristics. Table 24 presents the statistics about leavers and movers according to the Department's system for classification of school districts. A description of the districts included in each category follows the table.

Table 29: Attrition and Mobility Rates for Beginning Teachers in Ohio School Districts between 1997 and 2002 Classified According to the Department of Education District Typology

Category	1997	2002	Leavers	Move-Out	Move-In	Attrition %	Mobility %	Net Mobility %	Sum of Attrition% + Net Mobility %	Sum of Attrition% + Mobility %
1	280	178	69	79	46	25%	28%	12%	37%	53%
2	407	290	84	105	72	21%	26%	8%	29%	46%
3	422	324	95	94	91	23%	22%	1%	24%	45%
4	219	153	56	50	40	26%	23%	5%	31%	48%
5	444	281	119	90	46	27%	20%	10%	37%	47%
6	538	318	204	68	52	38%	13%	3%	41%	51%
7	748	566	237	94	149	32%	13%	-7%	25%	44%
8	318	284	92	40	98	29%	13%	-18%	11%	42%
Other	0	26	0	0	26					
	3376	2420	956	620	594	28%	18%	0%		

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The ninth category of "other" districts shows teachers who left the "regular" school districts to take a position in a joint vocational school district or a community school. The first eight categories have the meaning shown below:

Category 1 (Rural-High Poverty-Low Socio-economic Status) – 78 districts
Category 2 (Rural-Low Poverty-Low Socio-economic Status) – 157 districts
Category 3 (Small Town-Moderate Socio-economic Status) – 123 districts
Category 4 (Low Socio-economic Status -Very High Poverty) – 67 districts
Category 5 (Urban-Moderate Socio-economic Status) – 44 districts
Category 6 (Major Urban-Very High Poverty) – 14 districts
Category 7 (Urban/Suburban-High Socio-economic Status) – 89 districts
Category 8 (Urban/Suburban-Very High Socio-economic Status SES) – 35 districts

The results in Table 29 do not show many surprises after the presentation of the earlier tables. Teachers in the urban districts have a greater tendency to leave teaching entirely. Teachers in rural districts have a greater tendency to move between districts.
The table does show more clearly than the preceding presentations that the 124 suburban school districts with high SES Socio-economic Status benefit from a net migration of teachers from other school districts. While a total of 134 teachers moved out of jobs in these districts, 247 teachers moved into them. These data appear to justify a conclusion that the high and very high SES urban and suburban districts tend to attract teachers from other district categories.

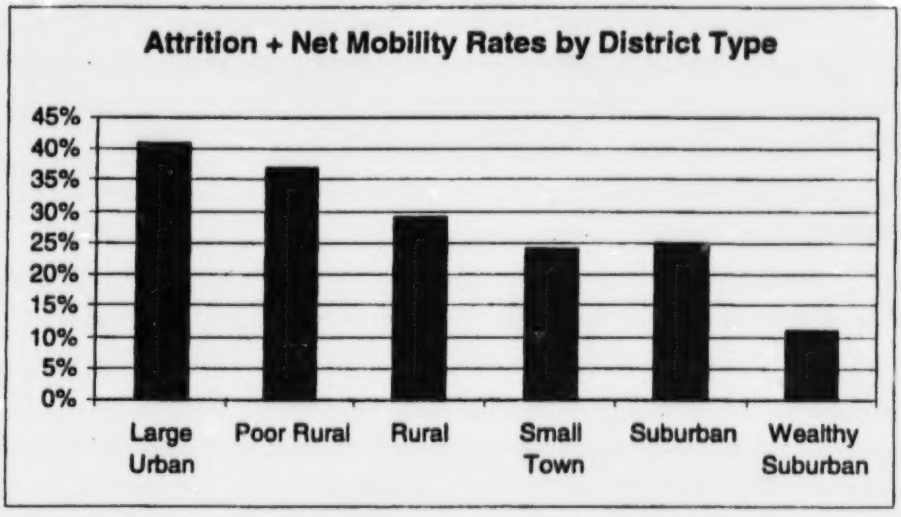
Table 29 also adds two new columns at the right side of the table. These columns show the sum of the leavers and movers for each group of districts. The rightmost column ("Sum of Attrition % + Mobility %") shows the total impact of changes by the 1997 beginning teachers. Rural high poverty districts (53%) and very poor urban districts (51%) show the highest combined rates of attrition plus mobility. However, the range between the highest and lowest is 11%. The very high SES districts record the lowest percentage of changes.

The components of this combined rate of change differ according to school district characteristics. Rural and small town areas tend to have lower leaver rates and higher mover rates. The urban and suburban areas show some tendency in the opposite direction with leavers outnumbering movers. Overall, it appears that about 40% to 50% of teachers will make a change within the first five years of teaching.

One explanation consistent with these data would conclude that teachers in all kinds of districts attempt to improve their employment prospects by changing employers. The percentage of those who make such an attempt remains high across all types of school districts. The fact that rural and small town teachers tend to move from one district employer to another school district employer may reflect the relative scarcity of other professional positions in those geographical areas. In contrast, the greater tendency in urban and suburban district for teachers to leave teaching may reflect the greater variety of professional opportunities in other careers available in metropolitan areas.

The second column to the right in Table 28 (Sum of Attrition % + Net Mobility %) reveals an additional insight regarding the mobility patterns of teachers in different types of school districts. When the in-migration of teachers into different types of school districts is taken into account, the range between the highest and lowest attrition plus net mobility increases to 30% as compared with the 11% range of combined attrition plus (out) mobility. Further, it becomes clear when the net mobility measure is included that wealthy suburban school districts are participating in the labor market in a manner distinctly different from the other districts in the state. While their attrition rate of 29% is not much different from the other types of school districts, their net mobility of -18% indicates that they attract far more teachers than they lose among those who move between districts. Finally, the largest urban districts and the poor rural districts are clearly seen to be at a disadvantage in the labor market when attrition plus net mobility is used as the measure. These findings are depicted graphically in Figure 11.

Figure 11



Race and gender. The information available about each beginning teacher included race and gender. The following table shows the attrition and mobility rates for white teachers compared to non-white teachers and for males compared to females.

Table 30: Attrition and Mobility Rates for Beginning Teachers in 1997 through 2002 by Race and Gender

	1997	2000	Leavers	Movers	Attrition Percent	Mobility Percent
White	3086	2260	826	599	27%	19%
Non-white	290	160	130	21	45%	7%
Male	998	727	271	215	27%	22%
Female	2378	1693	685	405	29%	17%

Table 30 shows that the number of non-white teachers with zero experience in 1997 equaled 290. These teachers represented about 8.6% of the 1997 beginner cohort. The

non-white portion of the Ohio population as a whole equaled 13.9% in the 2000 Census. The table also shows that the attrition percentage for non-white teachers exceeded attrition of white teachers by 18 points. The white teacher attrition rate is almost the same as the statewide average of 28%. While non-whites are more likely to leave teaching, they are less likely to move from the school district where they begin, at least within the first five years of teaching. The low mobility rate for non-white teachers of 7% shows that their tendency to move between school districts falls well short of the average for the state of 18% or of white teachers whose mobility percentage equals 19%.

While significant differences appear in the attrition and mobility rates for white teachers compared to non-white teachers, the comparison between male and female beginning teachers reveals much smaller differences. Females are only slightly more likely to leave teaching within five years compared to males – 29% versus 27%. Females are slightly less likely to move to a new school district than males.

Longterm attrition patterns among all educators. The State Teachers Retirement System (STRS) provided data about participants in the teachers' pension fund. These data enabled an analysis of hiring patterns over a ten-year period. This analysis identified the number of participants who entered the STRS system in each year from 1990 through 2000. Entry in 1990 means that a participant worked in the 1990-91 school year. By counting the number of new participants in each year and then by counting how many of each year's entrants remain after each passing year, it is possible to construct a statewide picture of teacher attrition.

The STRS data were easier to use for purposes of reviewing many years quickly, but these data also have limitations. First, the data include many employees who were not "teachers" as defined in the analyses of EMIS data shown in Tables 18 through 29. The participants in STRS include school administrators, other school professionals, and substitute teachers who do not necessarily hold permanent or full-time positions. Second, while the STRS data do contain an employer code, these codes differ from those used in the EMIS system. Time constraints did not permit the adaptation of the STRS employer codes into a detailed analysis of attrition or mobility by school district.
Table 31 shows the results of an analysis of new participants in STRS over the period from 1991 (1990-91 school year) through 2001.

The table should be read across each row. For example, beginning in the upper left-hand corner, the first row of the table shows the experience of the 1991 cohort of persons who entered the STRS system in that year. The first column shows that 3,403 new entrants joined the system in 1991. Of these, the second column shows that 3,251 remained one year later in 1992. The first row of the third column shows the number of participants remaining after two years from the 1991 entrants. And so on. The final column shows the number of participants who remained active in the STRS system in 2001 from each entrance cohort. For example, 2,348 of the original 3,403 entrants from 1991 remained active in 2001.

Table 31: Number of Active Participants in STRS for Each Entry Cohort Remaining in Each School Year – 1991 – 2001

Entry Year	IN 1991	IN 1992	IN 1993	IN 1994	IN 1995	IN 1996	IN 1997	IN 1998	IN 1999	IN 2000	IN 2001
1991	3,403	3,251	3,085	2,938	2,796	2,694	2,628	2,555	2,487	2,429	2,348
1992		3,169	3,012	2,851	2,673	2,570	2,501	2,427	2,336	2,268	2,213
1993			5,003	4,852	4,593	4,310	4,135	3,981	3,797	3,668	3,555
1994				2,235	2,159	2,042	1,939	1,871	1,776	1,726	1,663
1995					3,994	3,811	3,608	3,417	3,262	3,154	3,030
1996						4,190	3,986	3,756	3,566	3,418	3,287
1997							4,745	4,544	4,238	4,010	3,838
1998								5,934	5,672	5,313	5,012
1999									5,870	5,629	5,278
2000										6,421	6,099
2001											3,934

The number of new participants varies considerably from year to year. For example, the 2000 beginning cohort of 6,421 equals almost three times the number of beginners in 1994. While these differences in the size of each new cohort exist, it is not clear that any pattern suggests that the number of new participants grows each year. Growth occurred from 1995 through 2000 with only a slight reduction from 1998 to 1999, but the 2001 number of new entrants fell below the number of new entrants from 1995. Therefore, the data on the table do not permit a conclusion that the total number of new entrants shows a consistent pattern of increase.

Table 32 uses the data from Table 31 to display the experience of each entry cohort in percentages.

Table 32: Percentage of Active Participants in STRS for Each Entry Cohort Remaining in Each School Year – 1991 – 2001

Entry Year	IN 1991	IN 1992	IN 1993	IN 1994	IN 1995	IN 1996	IN 1997	IN 1998	IN 1999	IN 2000	IN 2001
1991	100%	96%	91%	86%	82%	79%	77%	75%	73%	71%	69%
1992		100%	95%	90%	84%	81%	79%	77%	74%	72%	70%
1993			100%	97%	92%	86%	83%	80%	76%	73%	71%
1994				100%	97%	91%	87%	84%	79%	77%	74%
1995					100%	95%	90%	86%	82%	79%	76%
1996						100%	95%	90%	85%	82%	78%
1997							100%	96%	89%	85%	81%
1998								100%	96%	90%	84%
1999									100%	96%	90%
2000										100%	95%
2001											100%

The top row of the table shows the experience of the new participants in the 1991 school year. 100% of the new participants remained in that year. Departures from active status

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reduced the percentage remaining from the original 1991 cohort each year. In 1992, 96% remained. In 1993, 91% remained. By 2001, 69% of the original 1991 beginners remained active in the STRS system. An exact comparison of these data with the results of the analysis of the EMIS data is not possible, because the former comparison had the benefit of 2002 data. However, a reference to the beginning cohort for 1997 in Table 26 shows that 4,745 participants entered the STRS system in that year. This year is the same year as the initial period of the EMIS comparisons in Tables 18 through 29. (The number is much larger than the numbers presented from the EMIS data because it includes more than full-time teachers.) By 2001, 3,838 of these 1997 entrants remained or 81% of the 1997 beginners. A remainder of 81% implies a departure rate of 19% after four years. Based on the pattern shown by earlier years, an additional 2% to 3% of the 1997 beginners probably departed by 2002. This estimate suggests a departure rate after five years of about 22%. The EMIS data showed a departure rate for the 1997 to 2002 period of 28%. Differences in the positions covered by the EMIS and the STRS systems could account for the 6% difference.

Table 33 uses the data from Tables 31 and 32 to present a record of departure rates. This table shows the same information as Table 31, but focuses on the percentage of beginners from each cohort who leave rather than the percentage who remain.

The first row of the table shows the 1991 entrants. The first column shows that 4% of the 1991 beginners left by 1992, i.e., after one year of employment. Consideration of the results in each column permits an easier comparison of the departure rates for each entrance cohort. Thus, the first column shows that the departure rate (or attrition rate) for each of the ten beginning cohorts ranged between 3% and 5% in the first year.

Table 32: Percentage of Participants in STRS for Each Entry Cohort Who Departed after Each School Year – 1991 – 2001

	Attrition	after:								
Entry Year	1 Year	2 Years	3 Years	4 Years	5 Years	6 Years	7 Years	8 Years	9 Years	10 Years
1991	4%	9%	14%	18%	21%	23%	25%	27%	29%	31%
1992	5%	10%	16%	19%	21%	23%	26%	28%	30%	
1993	3%	8%	14%	17%	20%	24%	27%	29%		
1994	3%	9%	13%	16%	21%	23%	26%			
1995	5%	10%	14%	18%	21%	24%				
1996	5%	10%	15%	18%	22%					
1997	4%	11%	15%	19%						
1998	4%	10%	16%							
1999	4%	10%								
2000	5%									

The "5 Years" column shows that after five years in the STRS system the attrition rates for the entry cohorts from 1991 through 1996 show remarkable consistency. Four of the six beginner cohorts show the same departure rate of 21%. The attrition rates indicated in

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this table reveal the same kind of consistency for other years. No dramatic increases in the tendency of new participants to depart the system appear from the data.

A final table provides some insight into the tendency of participants to move out of the STRS system and then to move back into the system again. Table 34 shows the experience accumulated within the STRS system for participants who entered in 1991 and who remained active in the system in 2001.

For example, the first row of the table shows that the STRS participants from the 1991 entry class with two years of experience (Column 1) accumulated by 2001 equaled two persons (Column 2). A person who worked without interruption from 1991 to 2001 would have eleven years of experience. The table shows that most of the 1991 cohort accumulated this maximum amount of work experience. Again, the table only includes those persons who remained active in 2001 from the original number of 3,403 entrants in 1991.

Table 34: Number of 1991 STRS Entry Cohort by Number of Years of Work Experience Between 1991 and 2001

Years of Experience	Number of STRS Members with Active Status in 2001
2	2
3	2
4	6
5	15
6	18
7	24
8	42
9	40
10	91
11	2108

The table has significance because it shows that a departure in any given year by a participant does not necessarily mean that the participant has left the system forever. For example, 91 persons accumulated ten years of experience over the 11-year period. This means that each of these persons departed from the system for one year out of the 11. Forty persons departed for two years. Forty-two persons for three years. And so on. These conclusions are implied by the combination of three facts:

- The STRS participant is still considered an active member;
- The participant entered the system 11 years before 2001;
- The participant has accumulated less than 11 years of experience over the 11 years since 1991.

Therefore, of the 2,348 participants from the 1991 beginners still active in 2001, a total of 240 spent at least one year not working in the STRS system during the 11-year period. This finding confirms that the attrition in each year for school professionals somewhat exaggerates the number of persons who leave the system entirely. About 10% of the survivors of the 1991 entry cohort have left and returned. If departures were counted in each year from 1991 through 2001, the cumulative amount of departures would equal 1,295. The net number of departures equaled 1,055. Thus, 240 of the 1,295 departures returned to the system. This means that about 18.5% of departures come back to further employment in the STRS system. Based on these observations, it appears that an analysis focused on the departures in each year will miss the returns in subsequent years.

The STRS analysis would have more value if it were related specifically to full-time teachers rather than to a broader range of school professionals and substitute teachers. Future analyses should apply the method of the STRS analysis to data about teachers to determine whether similar patterns of departure and return moderate the attrition rates identified in Tables 19 through 30.

Turnover Rates in Other Professions

Educators do not have a monopoly on concerns about turnover rates in the employment marketplace. For example, a study by the General Accounting Office (GAO) reported that studies of nurses revealed annual turnover rates of 15%, 21%, and 51% for different parts of the labor market for RN and LPN nurses (*Nursing Workforce Emerging Nurse Shortages Due to Multiple Factors*, GAO, July 2001). Similarly, information technology positions turnover at 15% to 20% per year. Mobility in the job market is a problem confronted by many companies in diverse industries. The number of consulting firms promising to help businesses address turnover issues confirms the existence of this problem in much of the labor market.

In recognition that the labor market has evolved into a more rapidly changing environment, the U.S. Department of Labor plans to launch a new tool for analyzing employment activity. This year the Bureau of Labor Statistics will begin to report the results of the Job Openings and Labor Turnover Survey (JOLTS). According to BLS:

> *"The Job Openings and Labor Turnover Survey (JOLTS) is a monthly count of job openings, hires, quits, layoffs & discharges, and other separations. JOLTS data help measure the demand for labor (employers' need for employees) and track the health of the economy."* BLS, Job Openings and Labor Turnover Survey, Frequently Asked Questions, http://www.bls.gov/jlt/jltprovq.htm.

Unfortunately, JOLTS will not report data specific to education occupations. However, the introduction of this new tool for labor market analysis indicates a recognition of the importance of the demand part of the labor market.

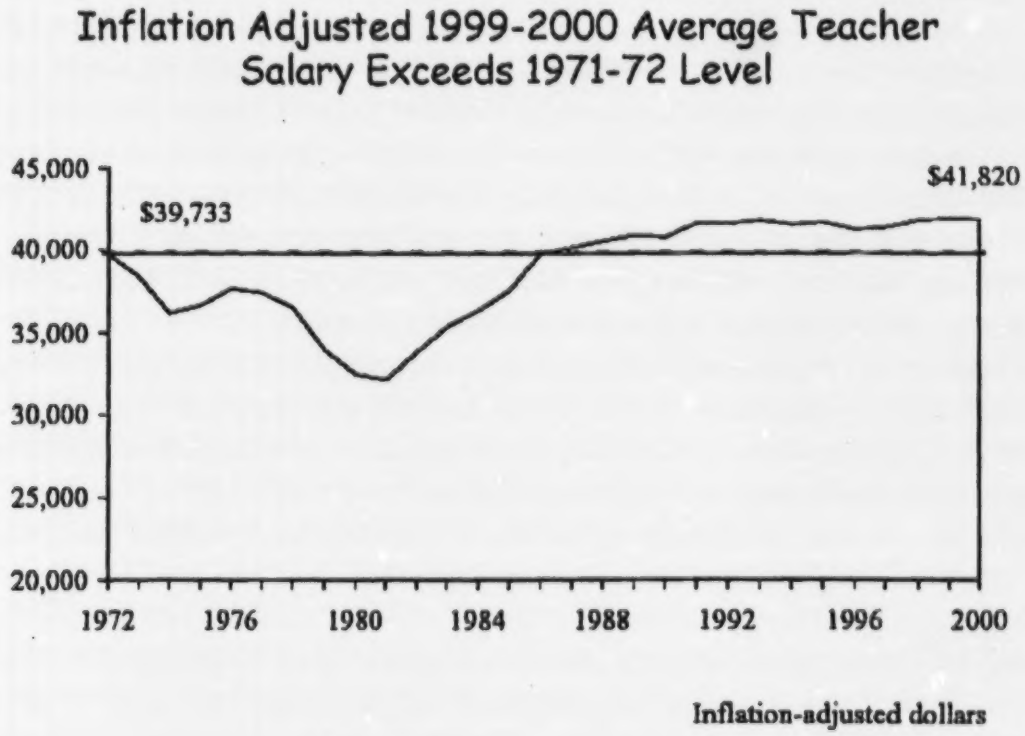
Attraction Away From Teaching – Teacher Salary Analysis

Some individuals may decide to leave (or never enter) the teaching profession because of unattractive aspects of the job. Other individuals may leave because an opportunity

outside of the public schools draws them away. Of course, in some cases, the underlying cause behind a teacher's departure may involve some combination of negative aspects of teaching and positive aspects of alternative opportunities. This section of the study focuses on the issue of how other careers may attract teachers away from teaching by offering better financial compensation.

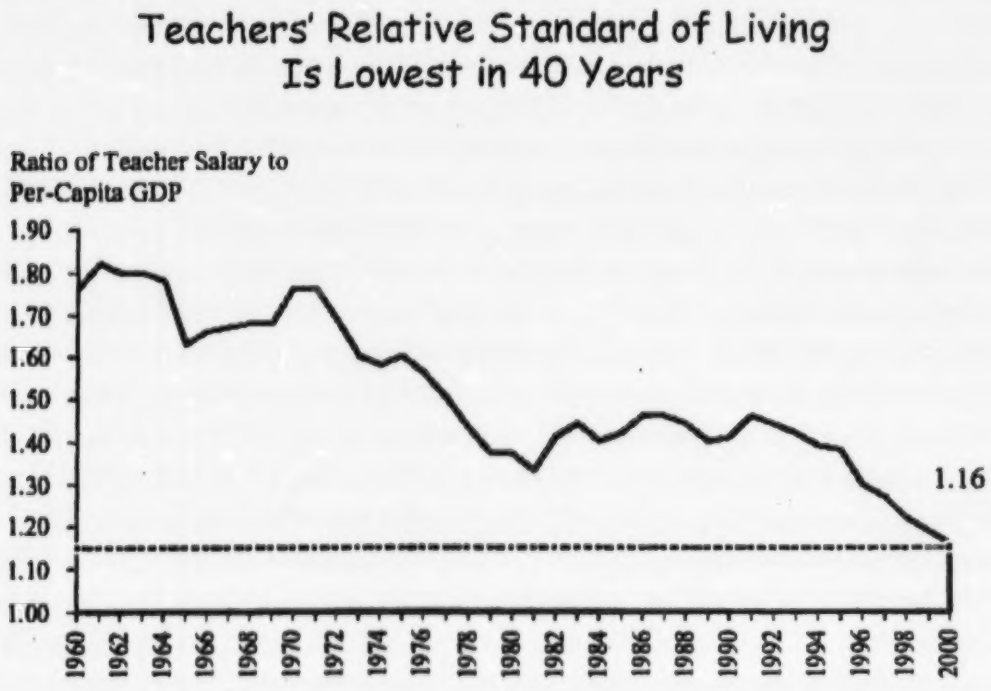
Education salaries over time. When considering the role that salary levels play in attracting individuals to education as opposed to other professions, it is useful to examine the path of teacher salaries over the past 30 years. The American Federation of Teachers (AFT) Research and Information Services Department published a study of teacher salary trends in 2000 ("Survey and Analysis of Teacher Salary Trends 2000", by F. Howard Nelson, Rachel Drown, and Jewell C. Gould, Washington D.C.).

Figure 12: Inflation Adjusted Teacher Salary Trends 1972-2000 from AFT Analysis



Source: American Federation of Teachers, research report available at www.aft.org/research.
Figures 12 and 13, reprinted from the AFT salary analysis, demonstrate that while teacher salaries have outpaced inflation since 1972, the relative standard of living of teachers has fallen precipitously from 1960 to 2000. In comparison with per capita Gross Domestic Product (GDP), teacher salaries in the year 2000 are at their lowest relative level in the past 40 years.

Figure 13: Teacher Salaries Relative to GDP: 1960-2000, from AFT Analysis



Source: American Federation of Teachers, research report available at www.aft.org/research

Teacher salaries lower than many other professions. While the decline of teacher salaries relative to per capita GDP may be related to issues of teacher recruitment and retention, it is also useful to compare teacher salaries to those of other professions.

Table 35 provides Ohio-specific comparative salary information for educators and workers in other fields. These data come from annual surveys of occupations conducted by the Bureau of Labor Statistics, U.S. Department of Labor. The table includes occupational groups of professional employees. Appendix I provides more detailed information, showing the specific occupations within each occupational group along with the salaries associated with them.

Table 35 excludes administrative and executive positions and blue collar and production type work. Therefore, occupations listed on the table include those for which an employee would need at least a college degree. Since the salary associated with each occupational group amounts to an average of the specific occupations with each group, some jobs pay higher salaries than the amount shown and some pay lower salaries. The "Education, Training, and Library" group includes elementary and secondary schoolteachers. The average salary for elementary and secondary schoolteachers exceeds the average for the occupational group. Reference to Appendix I shows that teachers'

average salaries range from a low of about $39,000 for kindergarten to a high of about $46,000 for high school vocational teachers. Salaries for all other elementary and secondary teachers fall between $41,000 and $42,000.

Table 35: Major Occupational Groups and Average Mean Annual Salaries – Ohio – 2000

Occupational Group	Salary
Legal	**$58,760**
Computer and Mathematical	**$53,480**
Architecture and Engineering	**$50,440**
Healthcare Practitioners and Technical	**$47,210**
Business and Financial Operations	**$43,910**
Life, Physical, and Social Science	**$40,910**
Education, Training, and Library	**$37,650**
Arts, Design, Entertainment, Sports, and Media	**$34,630**
Community and Social Services	**$32,190**

Data Source: Bureau of Labor Statistics, U.S. Department of Labor.

Table 35 shows that of nine occupational groups, the education, training, and library group finishes seventh in terms of financial rewards. If, instead of comparing the salary for the education, library, and training occupational group to other groups, the group of salaries specific to the teacher occupations were compared to the salaries for the other existing occupational groups, teachers only move up from seventh to sixth place in the compensation ranking.

Consideration of the average annual salaries paid for specific occupations (as shown in Appendix I) quickly reveals why public schools may experience difficulty in hiring and retaining teachers in the mathematics, computer, and science fields. For example, computer programmers averaged about $56,000 compared to secondary school teachers who averaged about $41,000. Similarly, chemists ($49,800), physicists ($78,630), microbiologists ($43,260), and biochemists ($63,430) all earned more than secondary teachers. Mathematicians ($71,280), actuaries ($69,090), and statisticians ($48,530) also receive significantly higher salaries than teachers.

Outside of the fields of mathematics and science, other opportunities offer competitive salaries for persons with an educational background comparable to teachers. For example, loan officers, insurance appraisers, and financial planners receive average salaries about equal to or greater than average teacher salaries.

However, the mathematics, computer, and science fields appear to exert the most influence to pull teachers or prospective teachers away from teaching by offering superior financial rewards. These incentives probably provide most of the explanation for shortages of teachers to teach mathematics, computer, and science courses.

In contrast, fewer competing occupations appear to offer a specific alternative to special education teachers. Social service occupations generally pay less than teaching positions. A few specific health-related jobs may offer attractive options for special education teachers, but pay differentials for specific competing opportunities do not appear to explain shortages of special education teachers in the same way that the alternative careers in the sciences explain shortages in mathematics, computer, and science subject areas.

If other career opportunities do not pull special education teachers away from teaching with financial incentives, shortages in special education teachers may result from conditions associated with special education which act as disincentives to continuing in the teaching profession.

Labor market comparisons based on education level. The preceding discussion documented how salaries associated with certain career options may attract prospective or active teachers out of the school and into other occupational classes. Salary comparisons of specific occupations quantify the alternative opportunities available to teachers.

Another perspective on the labor market considers average salaries by level of educational achievement. This analysis does not match specific jobs with specific compensation. Rather, it identifies how much return comparable investments in education can earn.

Table 35 summarizes national average earnings by age group and level of education attainment, allowing for a comparison with the average earnings of Ohio teachers. The data for this comparison come from the U.S. Census Bureau. About 45% of Ohio teachers have earned a master's degree. The remaining 55% have earned at least a bachelor's degree. For comparison purposes, the sum of 45% of the average (median) master's degree earnings and 55% of the average (median) bachelor's degree earnings equals $50,338. That total represents the blended average earnings of all Ohio teachers if they were paid at the median level for their level of educational attainment. In other words, if the average earnings of all teachers with only a bachelor's degree equaled $46,276 and the average earnings of all teachers with a master's degree equaled $55,302, then the average salary for Ohio teachers would equal $50,338. In fact, the average for Ohio teachers equals $41,713 for FY00 as reported by the Department of Education.

Table 36: National Average Earnings for Persons with Bachelor's and Master's Degrees – 2000

Full-time/Year Round	Average Earnings	Bachelor's Degree	Master's Degree
25 Years and Older	Mean	59,485	72,296
	Median	46,276	55,302
18 Years and Older	Mean	58,106	72,056
			Bachelor's & Master's
Ohio Teachers			**$41,713**

Source: U.S. Census Bureau, Current Population Survey, Tables PINC-03 and PINC-04 & Ohio Department of Education

Therefore, median income data for persons holding bachelor's and master's Degrees predicts that Ohio teachers would have median earnings of $50,338 in 2000, but in fact they earned $41,713, or $8,625 less than their level of educational attainment would predict. This analysis used the more conservative measure of income from the Census Bureau data -- the *median* income of degree holders. If the *mean* income were used instead, the discrepancy between teachers' incomes and the average income of persons with comparable degrees would be significantly larger.

Teachers in other states. Since the Bureau of Labor Statistics collects data on earnings by occupation in all states, a comparison of Ohio teacher salaries with the salaries of teachers in other states is easy to prepare. Table 37 shows such a comparison. Rather than show all 50 states, the table selected Ohio's border states plus three other states from the Midwest.

The table shows the mean annual salaries for teachers teaching in Ohio and eight other states. Generally, Ohio average salaries exceed West Virginia and Kentucky. They also tend to fall short of average salaries for Michigan and Pennsylvania. Comparisons with Indiana, Illinois, Wisconsin, and Minnesota show mixed results.

Table 37: Teacher Salaries in Selected States – 2000 (In Dollars)

Mean Annual Salary	Ohio	MI	PA	WV	KY	IN	IL	WI	MN
KDG	38,970	42,380	41,720	35,020	38,670	40,640	38,270	35,370	42,460
Elementary	41,020	44,310	47,560	35,260	37,800	41,240	40,850	40,320	42,330
Middle	42,060	46,190	47,380	35,320	38,330	39,960	41,350	42,590	41,660
Voc.Ed. Middle	42,080	49,730	55,650	32,300	37,240	45,320	41,380	43,890	37,490
Secondary	41,640	44,890	44,590	35,900	39,000	43,090	45,970	40,430	42,440
Voc.Ed. Secondary	46,070	49,260	45,630	37,000	43,460	45,060	43,720	42,900	41,780
Early Spec.Ed. *	40,900	46,920	45,490	34,690	35,930	42,140	41,500	40,360	42,310
Middle Spec.Ed.	40,840	48,850	48,770	34,290	37,540	43,910	43,200	38,050	39,810
Secondary Spec.Ed.	41,100	50,050	44,220	34,540	38,710	46,270	49,260	41,150	41,700

*Early Special Education includes pre-school through elementary school
Source: BLS, 2000 State Occupational and Wage Estimates

While Ohio salaries appear higher in a few categories in comparison with the last four states on the table, Indiana registers higher on seven of nine observations and Minnesota scores higher on five of nine observations. These results approximately correspond to data published by the American Federation of Teachers (AFT) for the 1999-2000 school year. AFT ranked the 50 states by overall average teacher salaries and adjusted the salaries to account for differences in the cost of living in each state. Michigan ranked first, Pennsylvania second, Illinois fourth, and Indiana seventh. Ohio appeared tenth on the AFT ranking. (*Survey and Analysis of Teacher Salary Trends 2000*, "State Ranking by 1999-2000 Average Teacher Salary Adjusted by the 1999 AFT Interstate Cost of Living Index," American Federation of Teachers.)

Another aspect of salary comparison involves consideration of *beginning* teacher salaries. Data compiled in the AFT report cited above show that in the 1999-2000 school year Ohio ranked 42nd in the average amount paid to beginning teachers compared to the other 50 states. Even Kentucky and West Virginia paid more than Ohio to beginning teachers. (The AFT report is available online at http://www.aft.org/research/survey00/salarysurvey00.pdf .) Comparisons of beginning teacher salaries to beginning salaries in other careers are readily available in the Occupational Outlook Handbook prepared by the Bureau of Labor Statistics, but those data were not included in this report. Generally, they follow the patterns shown in Table 34.

PART 3
TEACHER SUPPLY ANALYSIS

Analysis of Higher Education Pipeline Data

In July and August of 2001, all approved teacher preparation programs in Ohio were surveyed by the School Study Council of Ohio with reference to the number of graduates, their field(s) of study, their gender, and their race/ethnicity. Responses for the 1999-2000 and 2000-2001 academic years were expected to reflect the actual number of graduates while the responses for the 2001-2002 and 2002-2003 academic years were collected for projections.

The survey data compilation was limited by inaccurate, incomplete or non-responses from several of the institutions. The survey design did not address the fact that many education majors graduate with qualifications to teach in more than one subject area.

Analysis of this data was possible in several distinct areas. Estimates of the total number of annual graduates from 2000 to 2003 are provided, along with estimates of the number of graduates in six broad subject areas for the years 2001 and 2002. Finally, linkage of the projected number of minority graduates with current minority teacher and student data allows for a discussion of the issue of under-representation of minority teachers in Ohio.

Projected graduates 2000-2003 by subject area (2001 and 2002). Despite the aforementioned data problems, it was possible to estimate the number of graduates for each of the four years from 2000-2003.

Table 38: Estimated Number of Graduates from Ohio Teacher Preparation Programs – Source: School Study Council of Ohio Survey

Year	Estimated Number of Graduates
1999-2000	6733
2000-2001	6988
2001-2002	6908
2002-2003*	6551

*2003 was subject to a particularly high degree of incomplete data

Table 38 presents the estimated number of graduates from Ohio's teacher preparation programs, with slightly fewer than 7000 graduates projected for each year. This data appears consistent with estimates of slightly more than 7000 that have been reported by representatives of these institutions to the Governor's Commission on Teaching Success in March, 2002.

Despite data limitations, an attempt was made to tabulate projected subject area graduates in six fields. Table 38 summarizes the projected number of graduates by subject area for the years 2001and 2002.

Table 38: Projected Graduates by Subject Area, 2001 and 2002

Subject	Projected Graduates 2000-2001	Projected Graduates 2001-2002
English	247	454
Foreign Language	92	131
Math	211	485
Music	269	285
Science	477	724
Social Studies	772	1173
Total Graduates	6988	6908

The trend toward pronounced increases from 2001 to 2002 in the number of projected graduates in the subject areas chosen for study here stands in sharp contrast to the stability in the total number of graduates projected for these two years. While it is possible that Ohio's transition from the certificate system to the license system may explain these increases, it seems far more likely that the results derive from the data collection process.

Under-representation of minority teachers. Figure 14 demonstrates that minority education personnel (teachers, administrators and other certificated personnel) are under-represented in relation to the percentage of minority students. While minority students comprise 20% of total enrollment in FY01 in Ohio, minority personnel comprise only 7% of the education staff in the same year.

This under-representation appears to have two sources. First, Figure 13 demonstrates that the percentage of minority education graduates was only 10% in FY00, suggesting that there is also an under-representation of minority students in higher education teacher preparation programs. In order to establish that the 10% figure in FY00 was not a one-year anomaly, Figure 14 presents the percentage of minority graduates projected for each year from 2000 to 2003. While there is some variation from year to year (2001 is only 8% and 2003 is 12%), the percentage of minority graduates projected over the four-year period for which data is available is 10%.

Figure 14: Percent Minority Students and Personnel, FY01

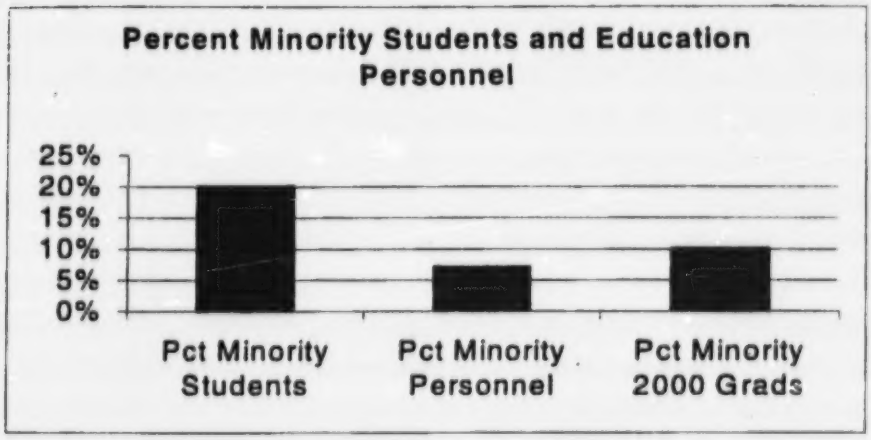
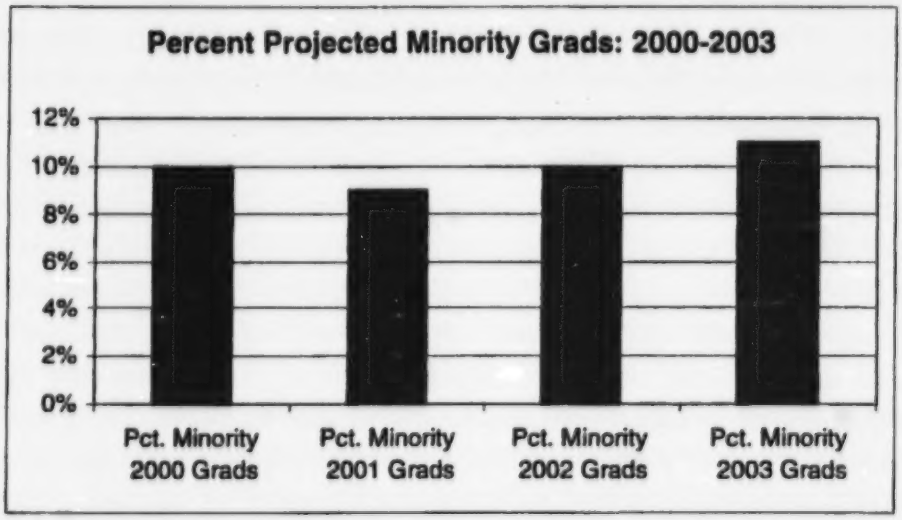


Figure 15



The second contributing factor in the under-representation of minority teachers requires a reference to Table 30 earlier in this study. It was reported in this table that the attrition percentage for non-white teachers after five years was 45%, a figure significantly higher than the 27% attrition rate of white teachers. Not only does the data suggest that fewer minorities enter teaching, but it seems that they also tend to leave at a greater rate as well.

This data suggests a need for policies that will not only increase recruitment of minority teachers and improve retention of these teachers once they are hired.

Factors Contributing to Attrition: "Reserve Pool" Survey Data

In September, 2001 the Ohio Department of Education, in collaboration with the School Study Council of Ohio, sent 3000 surveys to former Ohio teachers comprising what has become known as the "reserve pool." The reserve pool represents individuals who have taught previously in Ohio and have been out of teaching for at least three years.

The individuals to be surveyed were selected randomly from a database of the total reserve pool provided by the State Teachers Retirement System (STRS). The sample was stratified by zip code of current residence to ensure that teachers in particular geographic areas were not over- or under-represented and surveys were sent to former teachers living both within and outside of Ohio. Surveys were returned by 558 former teachers still living in Ohio, as well as105 teachers currently living outside of Ohio.
Fifty-four (51.4%) of the 105 individuals living outside of Ohio reported that they were still currently teaching. As a result, only the 51 surveys returned by out-of-state individuals who reported that they were no longer teaching provided responses that could be compared with those of the 558 in-state respondents.

Survey questions addressed three primary areas:

- Do you plan to return to teaching in the near future? (Yes or No)
- Why did you leave teaching? (list of 18 choices provided, plus "other")
- If you do not plan to return to teaching, what might change your mind? (list of 13 choices provided, plus "other")

Planned return. Responses to the question "Do you plan to return to teaching?" are most informatively divided into four categories. The first two are based on where the respondent currently lives: Ohio, or elsewhere. The third category, a subset of the first, consists of Ohio "reserve pool" teachers who left due to becoming a new parent; the fourth is Ohio's reserve pool of teachers who left for other reasons. Table 40 uses these categories to compare the rates of potential return within the "reserve pool" of teachers.

Table 40: Percent of Reserve Pool Teachers Planning to Return, by Category

Category	Percent Who Plan to Return to Teaching
Former Teachers Living Outside Ohio	29.4%
Former Teachers Living in Ohio	28.5%
Former Teachers Still Living in Ohio Who Left Due to a New Baby	40.5%
Former Teachers Still Living in Ohio Who Left Due to Other Reasons	24.6%

The survey results provided in Table 40 provide two insights:

First, the similarity in the percentage of former teachers who plan to return to teaching from both inside and outside of Ohio suggests that there is not any circumstance unique to Ohio that is driving people away from teaching.

Second, it is also clear that teachers who have left teaching because they became new parents are significantly more likely to return to teaching in the near future than are teachers who left teaching for other reasons.

However, it is important to compare the survey results regarding the intent to return to teaching with the STRS data analysis reported above, which evaluated the actual re-entry rate among teachers in Ohio. While 28.5% of the survey respondents still living in Ohio expressed the intention to return, the STRS data showed that only 18.5% of those teachers who left during the period from 1991 to 2000 actually returned to teaching. Further research is necessary to determine whether the survey respondents over-stated their intentions or whether a longer time frame for analysis of the STRS data would have resulted in a higher actual return rate.

Cause for leaving. "Why did you leave teaching?" Table 41 summarizes the survey results to the question regarding why respondents left teaching. While respondents were allowed to select more than one option (and instructed to include a priority ranking), the six responses summarized in Table 40 were the most frequently cited. Other reasons included student apathy toward learning, poor health or disability, insufficient mentoring, and other characteristics of the workplace. This survey, like most others that appear in the literature, did not provide a responses option that would indicate simple dislike of the work or a mismatch between the respondent's expectations and the realities of teaching.

Table 41: Reasons for Leaving Teaching – In-State vs. Out-of-State Comparison

Reason	In-State Respondents	Out-of-State Respondents
Became a New Parent	24.4%	25.5%
Insufficient Income	10.4%	9.8%
Lack of Student Discipline	6.1%	2.0%
Lack of Administrative Support	5.2%	7.8%
Family Relocation	3.8%	35.3%
Other	33%	17%

Becoming a new parent is the primary reason that respondents noted for leaving teaching. This reason explains more than one fourth of teacher attrition, regardless of whether the respondent still lived in Ohio. The identification of family relocation, the most frequent response among out-of-state respondents, is highly aligned with the recognition that each of these respondents has relocated. Insufficient income is the next-most-cited reason for leaving teaching, with again a strikingly similar propensity for both in-state and out-of-state respondents. Lack of student discipline or lack of administrative support, two measures of dissatisfaction with the respondents' particular teaching environment, are the two next-most-cited reasons for leaving the profession.

Enticement to return. Inducing former teachers from this reserve pool to return to teaching may provide a useful stratagem for alleviating shortages of teachers arising due to increases in retirements or in particular subject areas, grade levels, regions, or school districts. Thus, the final survey question, "What Factors Might Cause You to Return to Teaching?" was directed to those respondents who had had stated that they were <u>not</u> planning to return to teaching. As with the question concerning reasons for leaving teaching, respondents were allowed to choose more than one response, but instructed to rank multiple reasons in order of importance. The survey did not include a response option that indicated that nothing could persuade the respondent to return to the classroom. Table 42 summarizes the six most frequently cited reasons for both teachers who left teaching because they became new parents and for teachers who left teaching for other reasons.

Table 42: Incentives which Might Cause Teachers Not Planning to Return to Teaching to Change Their Minds

Reason	Teachers Who Left Due to Becoming a New Parent	Teachers who Left for Other Reasons
Opportunity to work part time	45.7%	12.6%
On-site child care available	21.1%	2.8%
Increased salary	19.8%	21.1%
Increased student discipline	6.2%	12.6%
Reduced non-teaching duties	4.9%	3.8%
Increased admin. Support	2.5%	7.9%

There are two conclusions to be drawn form the survey results presented in Table 42.

First, the incentives required to lure back teachers who left teaching for different reasons are indeed different. Increasing salary was the number one practice that might lure back reserve pool teachers who left for reasons other than becoming a parent and are not otherwise planning to return. This finding reinforces conclusions, presented earlier, that teachers are relatively low-paid when compared to others in alternative occupations with similar levels of education.

The second finding, also unsurprising, is that many former teachers who left because they had a child might be attracted back to the profession if family-friendly policies allowing part-time work or on-site child care were available. While over 40% of the reserve pool teachers who left because of becoming parents indicated a plan to return to teaching, the results in Table 42 suggest that, of the 60% who do not plan to return to teaching, 7 out of 10 might change their mind if policies which would assist with child care are enacted. This suggests that roughly 80% of those who left because of family obligations may eventually return to teaching at current salary levels, but with these other policy changes in place. The survey results indicate that increasing salaries would have a significant impact on inducing re-entry from the reserve pool as well.

Potential Impact of Ohio's New Licensure System on Teacher Supply

Ohio is currently in the midst of a transition from a system of "certification" of teachers and other education professionals to a new system of "licensing" educators. While the changes involved in this transition are too extensive to discuss fully in this report, the primary thrust of this initiative is to increase the quality of Ohio's teachers. It is important to understand, however, that some aspects of the new licensure system intended to increase the quality of Ohio's education labor force may possibly reduce the quantity of new teachers in Ohio, at least in the short-run. Some of the changes are expected to impact teachers who would otherwise plan to move to Ohio from another state, while some will affect potential teachers who are attending Ohio teacher preparation programs. All of the issues discussed below were synthesized from stakeholder testimony at the Governor's Commission on Teaching Success, are potential in nature and will require follow-up study.

Potential impact on teachers from outside Ohio. Several changes have potential to affect teachers moving into Ohio more than they affect teachers educated in Ohio:

1) *Candidates Praxis II Scores may be too low to meet Ohio's standards* – Ohio's passing scores on the Praxis II Assessments administered by the Educational Testing Service tend to be set high relative to those in other states. It is thus possible for a candidate to pass the Praxis II exam in their home state, yet not meet Ohio's standard. In addition, not all states require the Praxis exams at all, which creates an additional requirement for out-of-state teaching candidates.

2) *The candidate's certificate or license from another state is in a category different from the most comparable category in Ohio* – The simplest example of this scenario is that an

elementary teacher in another state may possess a K-8 license or certificate, while Ohio's new system now licenses elementary teachers for either grades P-3 or 4-9.

3) *Ohio's integrated social studies license requires multiple subject area expertise* – In many states, teachers are certified to teach social studies in specific subject areas (i.e. history, geography, and economics). These teachers would not be eligible for social studies licensure in Ohio, however, until they take enough college courses to satisfy Ohio's multiple subject area criteria.

These issues may cause teachers who are considering moving to Ohio to change their minds because of an unwillingness to take additional courses to satisfy Ohio's criteria or because of an unwillingness to take, or a concern about passing, the Praxis II exams.

Potential impact on teachers from within Ohio. Other changes need to be monitored to determine if they affect teachers educated in Ohio.

1) *Transition from K-8 Certificate to separate P-3 and 4-9 licenses may result in a shortage of 4th and 5th grade teachers*- The new grade 4-9 license requires demonstrated expertise in two subject areas; the new P-3 requires coursework across all subjects. These criteria are intended to increase the quality of teaching in these grades through better preparation of teachers. However, a university dean of education suggested that these criteria could also create an incentive for more teaching candidates to opt for the more general P-3 license, creating a shortage of 4th and 5th grade teachers.

2) *Integrated Social Studies License Requires Multiple Subject Area Expertise* – As was the case with candidates from outside Ohio, the multiple subject area requirement may dissuade potential teachers from opting for social studies licensure. Since social studies have historically been an area of over-supply in Ohio, this may not result in actual shortages in this area, however.

PART FOUR:
CONCLUSIONS AND RECOMMENDATIONS

Main Findings of the Study

Having examined multiple sources of data, the researchers identified several main themes and findings. These are listed below.

1) This study has verified the "conventional wisdom" regarding the teacher shortages in specific subject areas facing the state in 2002. Specific subject areas in shortage are math, science, and special education, as many practitioners and research studies suggest, along with music, foreign languages and computers, which shortages tend to be less well recognized.

2) Special education seems to be the most severe area of teacher shortage in the state. Ohio has experienced a steady increase in the number and percentage of special education students. Both a disproportionately large number of job vacancies and a large and increasing proportion of temporary teaching certificates suggest a severe shortage of qualified professionals in this area. In addition, special education teachers were shown to have a higher attrition rate than teachers as a whole. Part of this explanation may be that special education teachers stay in teaching but switch out of special education. This may be a contributing factor in the large demand for teachers with these credentials.

3) A second broad category of teacher shortages is comprised of large urban and poor rural school districts that have difficulty retaining teachers.

4) Minority teachers and other education professionals are significantly under-represented in comparison to the percentage of minority students attending Ohio public schools. This shortage appears to result from a combination of both a disproportionately low percentage of minority students pursuing teaching degrees and a significantly higher propensity of new minority teachers to leave teaching. It is not clear if the minority teachers are leaving to pursue opportunities outside of teaching or whether they are leaving as a reaction to characteristics of the workplace.

5) Analysis of the age and experience of Ohio's current teaching force suggests that Ohio has recently begun a period where retirements will increase at a much more rapid pace than in recent years. This trend will likely get worse before it gets better.

6) Analysis of teacher turnover and attrition suggests that the percentage of Ohio teachers who leave teaching within the first five years of employment (28%) resembles the percentage of such teachers in other states.

7) Comparisons with turnover rates in other fields suggest that attrition rates for teachers are not unusually high by comparison. However, a certain level of turnover is both inevitable and desirable. It is desirable, because, as is the case with any profession, some people learn that they do not perform well in the career that they have chosen.

8) Analysis of mobility of teachers across districts reveals significant differences among different types of schools. When both in- and out-migration are considered, large urban and poor rural districts fare the worst and suburban schools fare the best.

9) Research here has found that 18.5% of teachers who leave teaching later return. This percentage is less than the 28.5% intended return rate found by analyzing results of surveys of teachers who have left teaching and still live in Ohio. Further study of this issue is necessary to draw conclusions regarding the discrepancy between the stated intent of teachers to return and the actual rate exhibited between 1991 and 2001.

10) Becoming a new parent was the number one single reason cited for leaving teaching by survey respondents; 40% of these respondents stated an intention to return to teaching, significantly higher than the percentage among those who left teaching for other reasons.

11) Survey responses by teachers who have left and are <u>not</u> planning to return to teaching indicate that policy changes may cause them to change their minds. Part-time work opportunities and on-site child care were the two most frequently cited policies among those who left because they had a child, while increased salary was the most frequently cited policy which might bring back teachers who left for other reasons.

12) Analysis of teacher salaries over time suggests that teachers have lost ground in relative terms. Analysis of teacher salaries in comparison with salaries in other occupations also suggests that teachers are relatively low-paid for the level of education they have attained. Finally, comparison of Ohio teacher salaries with teacher salaries in other midwestern states suggests that Ohio is roughly in the middle – higher than some and lower than some.

13) Effects of the new licensure system (designed to improve the quality of teachers in Ohio) need to be monitored over the next few years.

Recommendations for Next Steps in Understanding Teacher Supply and Demand

The focus of this report was to provide analysis of the current and expected future supply and demand conditions characterizing the labor market for teachers and other education professionals in Ohio. This technical report has identified a number of key areas where Ohio faces challenges. It has not explored in detail the various policy steps necessary to resolve these issues. This process will be the subject of further study.

Dr. Zelman, Superintendent of Public Instruction, has committed to developing an on-going system to analyze and report supply and demand data to the Board on an annual basis. To shape this system, the report recommends the following:

> **An annual report should track trends and changes.** The findings in this report are largely either preliminary in nature or based upon a single time frame of

detailed analysis. The Ohio Department of Education will develop an annual report of supply and demand conditions to present data in a systematic and comparable format over a period of years. Such a report should allow for the tracking of trends and changes over time to facilitate informed policy-making.

The Integrated Licensure System database should be used to compile data for the annual report. It is imperative that Ohio develop a database to track teachers and other education professionals over time for the express purpose of analyzing supply and demand trends and developing appropriate policy. The Integrated Licensure System currently under development should be capable of meeting this need.

The rate and process of former teachers' reentry into the labor market should be studied. Ohio appears to be approaching a period where increased retirements, combined with possible decreases in the number of entering teachers due to strengthened licensing requirements, will place even more pressure on the education labor market. The state needs to plan now to increase recruitment efforts for new teachers, and consider strategies for improving retention rates of existing teachers. A better understanding of the rate at which former teachers re-enter the labor market will aid the planning of those strategies.

Recruitment and retention issues for specific types of teachers in specific locations should be examined. Ohio also faces many shortages for specific types of teachers. Understanding issues related to recruitment and retention of minority and special education teachers will help the state plan to meet those needs. In addition, further research to gain understanding of why urban and rural districts have difficulty retaining teachers is also necessary in order to develop policies which will be effective in combating these trends.

APPENDIX I:
PROFESSIONAL OCCUPATIONS AND SALARIES

Major occupational groups appear on shaded lines in boldface. Specific occupations appear on lines without shading. Teachers appear in boldface but without shading.

Occupation	Salary
Agents and Business Managers of Artists, Performers, and Athletes	$43,730
Purchasing Agents and Buyers, Farm Products	$40,160
Wholesale and Retail Buyers, Except Farm Products	$39,310
Purchasing Agents, Except Wholesale, Retail, and Farm Products	$42,320
Claims Adjusters, Examiners, and Investigators	$40,210
Insurance Appraisers, Auto Damage	$43,980
Compliance Officers, Except Agriculture, Construction, Health and Safety, and Transportation	$42,930
Cost Estimators	$45,400
Emergency Management Specialists	$40,350
Employment, Recruitment, and Placement Specialists	$36,880
Compensation, Benefits, and Job Analysis Specialists	$42,800
Training and Development Specialists	$41,080
Management Analysts	$54,190
Meeting and Convention Planners	$34,980
Accountants and Auditors	$47,090
Appraisers and Assessors of Real Estate	$48,430
Budget Analysts	$49,920
Credit Analysts	$41,560
Financial Analysts	$52,830
Personal Financial Advisors	$74,680
Insurance Underwriters	$46,250
Financial Examiners	$52,130
Loan Counselors	$31,100
Loan Officers	$46,000
Tax Examiners, Collectors, and Revenue Agents	$43,620
Tax Preparers	$33,540
Computer and Information Scientists, Research	$70,830
Computer Programmers	$56,390
Computer Software Engineers, Applications	$61,960
Computer Software Engineers, Systems Software	$62,290
Computer Support Specialists	$40,290
Computer Systems Analysts	$57,860
Database Administrators	$56,030
Network and Computer Systems Administrators	$50,630
Network Systems and Data Communications Analysts	$55,590
Actuaries	$69,090
Mathematicians	$71,280
Operations Research Analysts	$52,580
Statisticians	$48,530

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Mathematical Technicians	$38,460
[redacted]	[redacted]
Architects, Except Landscape and Naval	$53,770
Landscape Architects	$40,680
Cartographers and Photogrammetrists	$34,560
Surveyors	$35,810
Aerospace Engineers	$72,680
Agricultural Engineers	$52,400
Biomedical Engineers	$54,320
Chemical Engineers	$63,040
Civil Engineers	$52,590
Computer Hardware Engineers	$56,340
Electrical Engineers	$61,470
Electronics Engineers, Except Computer	$61,560
Environmental Engineers	$53,980
Health and Safety Engineers, Except Mining Safety Engineers and Inspectors	$52,390
Industrial Engineers	$57,600
Materials Engineers	$61,180
Mechanical Engineers	$53,080
Mining and Geological Engineers, Including Mining Safety Engineers	$52,870
Nuclear Engineers	$80,020
Petroleum Engineers	$69,480
Architectural and Civil Drafters	$33,340
Electrical and Electronics Drafters	$37,400
Mechanical Drafters	$38,220
Aerospace Engineering and Operations Technicians	$40,560
Civil Engineering Technicians	$37,480
Electrical and Electronic Engineering Technicians	$40,040
Electro-Mechanical Technicians	$35,260
Environmental Engineering Technicians	$31,600
Industrial Engineering Technicians	$39,560
Mechanical Engineering Technicians	$36,270
Surveying and Mapping Technicians	$29,090
[redacted]	[redacted]
Agricultural and Food Scientists	$56,690
Biochemists and Biophysicists	$63,430
Microbiologists	$43,260
Zoologists and Wildlife Biologists	$37,190
Conservation Scientists	$42,160
Foresters	$37,870
Epidemiologists	$42,570
Medical Scientists, Except Epidemiologists	$44,440

Occupation	Salary
Physicists	$78,630
Atmospheric and Space Scientists	$44,280
Chemists	$49,870
Materials Scientists	$48,280
Environmental Scientists and Specialists, Including Health	$41,600
Geoscientists, Except Hydrologists and Geographers	$54,270

Hydrologists	$51,530
Economists	$55,750
Market Research Analysts	$57,030
Survey Researchers	$21,080
Clinical, Counseling, and School Psychologists	$49,270
Industrial-Organizational Psychologists	$48,360
Urban and Regional Planners	$43,540
Agricultural and Food Science Technicians	$29,160
Biological Technicians	$33,310
Chemical Technicians	$32,140
Geological and Petroleum Technicians	$33,600
Environmental Science and Protection Technicians, Including Health	$35,640
Forensic Science Technicians	$40,870
Forest and Conservation Technicians	$19,140
Substance Abuse and Behavioral Disorder Counselors	$29,300
Educational, Vocational, and School Counselors	$47,120
Marriage and Family Therapists	$40,320
Mental Health Counselors	$33,430
Rehabilitation Counselors	$32,090
Child, Family, and School Social Workers	$31,440
Medical and Public Health Social Workers	$35,270
Mental Health and Substance Abuse Social Workers	$29,560
Health Educators	$34,790
Probation Officers and Correctional Treatment Specialists	$37,390
Social and Human Service Assistants	$23,110
Clergy	$27,490
Directors, Religious Activities and Education	$27,600
Lawyers	$81,620
Arbitrators, Mediators, and Conciliators	$41,810
Judges, Magistrate Judges, and Magistrates	$53,390
Paralegals and Legal Assistants	$35,730
Court Reporters	$42,990
Law Clerks	$28,500
Title Examiners, Abstractors, and Searchers	$31,340
Business Teachers, Postsecondary	$53,800
Computer Science Teachers, Postsecondary	$45,520
Mathematical Science Teachers, Postsecondary	$48,480
Occupation	**Salary**
Engineering Teachers, Postsecondary	$59,820
Agricultural Sciences Teachers, Postsecondary	$59,350
Biological Science Teachers, Postsecondary	$57,290
Forestry and Conservation Science Teachers, Postsecondary	$58,010
Atmospheric, Earth, Marine, and Space Sciences Teachers, Postsecondary	$52,290
Chemistry Teachers, Postsecondary	$55,690
Environmental Science Teachers, Postsecondary	$60,160
Physics Teachers, Postsecondary	$59,210
Anthropology and Archeology Teachers, Postsecondary	$56,380

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Area, Ethnic, and Cultural Studies Teachers, Postsecondary	$57,280
Economics Teachers, Postsecondary	$62,210
Geography Teachers, Postsecondary	$56,030
Political Science Teachers, Postsecondary	$51,240
Psychology Teachers, Postsecondary	$53,020
Sociology Teachers, Postsecondary	$46,120
Health Specialties Teachers, Postsecondary	$63,110
Nursing Instructors and Teachers, Postsecondary	$48,370
Education Teachers, Postsecondary	$45,570
Library Science Teachers, Postsecondary	$45,490
Criminal Justice and Law Enforcement Teachers, Postsecondary	$42,100
Law Teachers, Postsecondary	$67,580
Social Work Teachers, Postsecondary	$45,110
Art, Drama, and Music Teachers, Postsecondary	$48,000
Communications Teachers, Postsecondary	$45,860
English Language and Literature Teachers, Postsecondary	$43,290
Foreign Language and Literature Teachers, Postsecondary	$46,010
History Teachers, Postsecondary	$47,680
Philosophy and Religion Teachers, Postsecondary	$46,380
Graduate Teaching Assistants	$20,100
Home Economics Teachers, Postsecondary	$41,080
Recreation and Fitness Studies Teachers, Postsecondary	$38,960
Vocational Education Teachers, Postsecondary	$36,170
Preschool Teachers, Except Special Education	$18,590
Kindergarten Teachers, Except Special Education	**$38,970**
Elementary School Teachers, Except Special Education	**$41,020**
Middle School Teachers, Except Special and Vocational Education	**$42,060**
Vocational Education Teachers, Middle School	**$42,080**
Secondary School Teachers, Except Special and Vocational Education	**$41,640**
Vocational Education Teachers, Secondary School	**$46,070**
Special Education Teachers, Preschool, Kindergarten, and Elementary School	**$40,900**
Special Education Teachers, Middle School	**$40,840**
Special Education Teachers, Secondary School	**$41,100**
Adult Literacy, Remedial Education, and Ged Teachers and Instructors	$29,830
Self-Enrichment Education Teachers	$26,440
Archivists, Curators, and Museum Technicians	$32,830

Occupation	Salary
Librarians	$42,500
Library Technicians	$23,640
Audio-Visual Collections Specialists	$23,250
Instructional Coordinators	$47,300
Teacher Assistants	$20,220
Art Directors	$59,320
Fine Artists, Including Painters, Sculptors, and Illustrators	$34,890
Multi-Media Artists and Animators	$36,300
Commercial and Industrial Designers	$52,530
Fashion Designers	$49,520
Floral Designers	$18,370

Graphic Designers	$35,160
Interior Designers	$38,370
Merchandise Displayers and Window Trimmers	$24,360
Set and Exhibit Designers	$35,410
Actors	$18,880
Producers and Directors	$40,140
Athletes and Sports Competitors	$29,040
Coaches and Scouts	$31,490
Umpires, Referees, and Other Sports Officials	$18,750
Dancers	$24,440
Choreographers	$36,620
Music Directors and Composers	$34,270
Musicians and Singers	$65,760
Announcers	$27,910
News Analysts, Reporters and Correspondents	$33,540
Public Relations Specialists	$39,110
Editors	$41,360
Technical Writers	$41,510
Writers and Authors	$39,100
Interpreters and Translators	$29,800
Audio and Video Equipment Technicians	$27,400
Broadcast Technicians	$26,910
Radio Operators	$26,300
Sound Engineering Technicians	$35,420
Photographers	$24,280
Camera Operators, Television, Video, and Motion Picture	$29,010
Film and Video Editors	$38,210

Chiropractors	$93,470
Dentists	$129,480
Dietitians and Nutritionists	$37,420
Optometrists	$95,760
Pharmacists	$66,960
Anesthesiologists	$128,820
Occupation	**Salary**
Family and General Practitioners	$114,530
Internists, General	$133,380
Obstetricians and Gynecologists	$138,610
Pediatricians, General	$112,410
Psychiatrists	$121,650
Surgeons	$137,100
Physician Assistants	$70,280
Podiatrists	$90,090
Registered Nurses	$43,280
Audiologists	$42,300
Occupational Therapists	$52,930
Physical Therapists	$60,240
Radiation Therapists	$47,550
Recreational Therapists	$30,110
Respiratory Therapists	$36,480

Speech-Language Pathologists	$49,320
Veterinarians	$68,230
Medical and Clinical Laboratory Technologists	$39,410
Medical and Clinical Laboratory Technicians	$27,730
Dental Hygienists	$49,790
Cardiovascular Technologists and Technicians	$35,340
Diagnostic Medical Sonographers	$40,520
Nuclear Medicine Technologists	$37,500
Radiologic Technologists and Technicians	$33,380
Emergency Medical Technicians and Paramedics	$23,990
Dietetic Technicians	$26,660
Pharmacy Technicians	$19,580
Psychiatric Technicians	$23,960
Respiratory Therapy Technicians	$33,360
Surgical Technologists	$28,230
Veterinary Technologists and Technicians	$22,750
Licensed Practical and Licensed Vocational Nurses	$31,640
Medical Records and Health Information Technicians	$23,680
Opticians, Dispensing	$26,610
Orthotists and Prosthetists	$54,380
Occupational Health and Safety Specialists and Technicians	$43,780
Athletic Trainers	$32,890

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